



## Upgrading From PDI 4.2.1 to 4.3



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## Company Information

Pentaho Corporation  
Citadel International, Suite 340  
5950 Hazeltine National Drive  
Orlando, FL 32822  
Phone: +1 407 812-OPEN (6736)  
Fax: +1 407 517-4575  
<http://www.pentaho.com>

E-mail: [communityconnection@pentaho.com](mailto:communityconnection@pentaho.com)

Sales Inquiries: [sales@pentaho.com](mailto:sales@pentaho.com)

Documentation Suggestions: [documentation@pentaho.com](mailto:documentation@pentaho.com)

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# Introduction

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This guide shows current Pentaho Data Integration Enterprise Edition customers how to upgrade from PDI 4.2.1 to 4.3. If you are upgrading from a version of PDI older than 4.2.1, refer instead to PDI Upgrade Guide documents from previous PDI releases.



**Note: This guide is only for Enterprise Edition upgrades.** You cannot upgrade a PDI 4.2.1 Community Edition deployment to PDI 4.3 Enterprise Edition through this process.

## What's new in 4.3?

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Below is a list of major changes between Pentaho Data Integration 4.2.x and 4.3:

### Exasol database support

The Exasol Database support is integrated since PDI Version 4.3 RC. Contact Exasol directly to get the latest version and the JDBC driver suitable to your server version. To install, simply copy the JDBC driver jar(s) into your PDI distribution folder `data-integration/libext/JDBC`. After restarting PDI, the connection with Exasol can be established.



**Note:** You may define the default schema in the Connection/Advanced/Preferred Schema name.



**Note:** As with any column store database, it is best to use steps that are optimal from a performance standpoint in this regard (e.g. the Dimension Lookup/Step).

### Removal of JDBC drivers

Due to licensing concerns, PDI no longer ships with the following drivers:

- ExtenDB
- IBM UniVerse
- Ingres
- Kingbase
- MySql Connector/J
- Oracle

You will have to retrieve these driver JARs from the manufacturer, vendor, or developer; or you can copy them from your previous PDI instance.

### Expanded support for Big Data technologies

- More recent Hadoop distributions are supported
- There is no longer a need for a separate Hadoop node installation package or procedure; this is now done automatically when connecting to the Hadoop service from PDI
- Added support: Cassandra, MapR, MongoDB
- Renamed "Hadoop Transformation Job Executor" to "Pentaho MapReduce"
- The *Using Hadoop With Pentaho Data Integration* document has been renamed to *The Pentaho Big Data Guide* to better reflect its broader array of content

## Upgrade Best Practices

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

This guide contains instructions for performing the safest possible upgrade. There may be quicker ways, but the software's architects recommend the path outlined in this guide for the safest and most predictable transition to PDI 4.3.



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

# Upgrade Checklist

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

Step	Procedure	Done
Step 1	Download the PDI 4.3 client and server packages and the Pentaho Enterprise Console package from the Pentaho Customer Support Portal.	
Step 2	Stop your DI Server and Pentaho Enterprise Console server. <b>Ensure that the DI Server process is stopped</b> ; if it is not, file copy and delete commands could silently fail later on.	
Step 3	Back up your content files, database repository or enterprise repository; your ~/.kettle directory; your PDI client tool directory, and your /pentaho/server/data-integration-server/pentaho-solutions/ directory. <b>Modify this and all future paths to match your PDI deployment.</b>	
Step 4	On your PDI server, rename the /pentaho/server/data-integration-server/ directory to <b>data-integration-server-old</b> .	
Step 5	Create a new, empty /pentaho/server/data-integration-server/ directory.	
Step 6	Rename the /pentaho/server/enterprise-console/ directory to <b>enterprise-console-old</b> .	
Step 7	Create a new, empty /pentaho/server/enterprise-console/ directory.	
Step 8	Unpack the new <b>pdi-ee-server-4.3.0-GA</b> archive to /pentaho/server/data-integration-server/.	
Step 9	Copy all of the <b>applicationContext</b> files from /pentaho/server/data-integration-server-old/pentaho-solutions/system/ (the old solutions directory) to the new one.	
Step 10	Copy the <b>pentaho-spring-beans.xml</b> file from /pentaho/server/data-integration-server-old/pentaho-solutions/system/ (the old solutions directory) to the new one.	
Step 11	Transfer the admin role information and merge any custom changes from your old <b>pentaho.xml</b> and <b>repository.spring.xml</b> files to the new ones.	
Step 12	Copy the entire <b>quartz</b> directory from /data-integration-server-old/pentaho-solutions/ to the new one.	
Step 13	Copy the entire <b>repository</b> directory from /data-integration-server-old/pentaho-solutions/system/jackrabbit/ to the new one.	
Step 14	Copy <b>repository.xml</b> from the old <b>jackrabbit</b> directory to the new one.	
Step 15	Copy the entire <b>jre</b> directory from /data-integration-server-old/ to the new one.	
Step 16	Merge any custom changes from your old DI Server configuration files to the new ones.	
Step 17	Copy the following files from the old Pentaho Enterprise Console to the new one: console.xml, console.properties, login.properties, login.conf, log4j.xml.	
Step 18	Unpack the <b>pec-4.5.0-GA</b> archive to the /pentaho/server/ directory.	
Step 19	Copy the following files from the old Pentaho Enterprise Console to the new one: console.xml, console.properties, login.properties, login.conf, log4j.xml; and the entire /resource/config/hsqldb/ directory.	

Step	Procedure	Done
Step 20	Start the DI Server and Pentaho Enterprise Console and test their functionality and availability.	
Step 21	On your PDI workstations, delete the <code>/pentaho/design-tools/data-integration/</code> directory after you have ensured that there are no KJB or KTR content files stored there.	
Step 22	Unpack the <b>pdi-ee-client-4.3.0-GA</b> archive to the <code>/pentaho/design-tools/</code> directory.	
Step 23	Start the Data Integration client tools that you normally use, and ensure that they work properly, can access existing content, create and share new content, run existing schedules, create new schedules, and have a connection to the DI Server (if you are using it).	
Step 24	Perform any other necessary testing, then delete any installation artifacts and the <b>data-integration-server-old</b> directory, and inform users that the upgrade is complete.	



## Obtaining the Archive Packages

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

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

- **DI Server for Windows:** `pdi-ee-server-4.3.0-GA.zip`
- **DI Server for Linux/Solaris/OS X:** `pdi-ee-server-4.3.0-GA.tar.gz`
- **Data Integration client tool Windows package:** `pdi-ee-client-4.3.0-GA.zip`
- **Data Integration client tool Linux/Solaris/OS X package:** `pdi-ee-client-4.3.0-GA.tar.gz`

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

- **Pentaho Enterprise Console for Linux/Solaris/OS X:** `pec-4.5.0-GA.tar.gz`
- **Pentaho Enterprise Console for Windows:** `pec-4.5.0-GA.zip`

## Creating Backups

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

### Backing Up Content Files

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If you do not use a database or enterprise repository for storing PDI content, then you are saving individual KJB and KTR files on a local or network drive. Hopefully you have created a sensible directory structure and naming convention for them. If not, this may be a good time to organize them properly.

Once you have all of your content in one directory, simply create a Zip or tar archive of it and copy the archive to a safe location outside of your local machine, such as a network drive or removable media.

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

### Backing Up a Database Repository

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

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

### How to Back Up the Enterprise Repository

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



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

1. Stop the DI Server.

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

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

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

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

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

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

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

### Backing Up the .kettle Directory

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

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

## Backing Up the data-integration Directory


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

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


# Upgrading a Data Integration Server

**Ensure that the DI Server and Pentaho Enterprise Console are stopped before continuing.** You must have a PDI 4.2.1 DI Server installed in order to follow this procedure; if you do not use the DI Server, this upgrade task is unnecessary.

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

Follow the instructions below to upgrade your Data Integration Server to version 4.3.

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

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

```
mv /home/pentaho/pentaho/server/data-integration-server/ /home/pentaho/pentaho/
server/data-integration-server-old/
```

2. Unpack the **pdi-ee-server-4.3.0-GA** package to the parent of the directory you just renamed.

```
tar zxvf ~/downloads/pdi-ee-server-4.3.0-GA.tar.gz -C /home/pentaho/pentaho/server/
```

3. Copy all of the **applicationContext** files from the `/data-integration-server-old/pentaho-solutions/system/` directory to the new one, overwriting the equivalent files that are already there.

```
cp applicationContext-* ~/pentaho/server/data-integration-server/pentaho-solutions/
system/
```

4. Edit the **applicationContext-spring-security-hibernate.xml** file in `/data-integration-server/pentaho-solutions/system/` and add a **PentahoUserRoleMapping.hbm.xml** value to the **mappingResources** property, as shown in this example:

```
<property name="mappingResources">
  <list>
    <value>PentahoUser.hbm.xml</value>
    <value>PentahoRole.hbm.xml</value>
    <value>PentahoUserRoleMapping.hbm.xml</value>
  </list>
</property>
```

5. Copy the **pentaho-spring-beans.xml** file from the `/data-integration-server-old/pentaho-solutions/system/` directory to the new one, overwriting the equivalent file that is already there.

```
cp pentaho-spring-beans.xml ~/pentaho/server/data-integration-server/pentaho-
solutions/system/
```

6. Transfer the information about the **admin** role from the following two old files to the new ones: **/pentaho-solutions/system/pentaho.xml** and **/pentaho-solutions/system/repository.spring.xml**

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

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

7. Copy the entire old **quartz** directory from `/data-integration-server-old/pentaho-solutions/` to the new one.

```
cp -r ./quartz ~/pentaho/server/data-integration-server/pentaho-solutions/
```

8. Copy the entire old **repository** directory from `/data-integration-server-old/pentaho-solutions/system/jackrabbit/` to the new one.

```
cp -r ./jackrabbit/repository/ ~/pentaho/server/data-integration-server/pentaho-solutions/system/jackrabbit/
```

9. Copy the old `/pentaho-solutions/system/jackrabbit/repository.xml` file to the new jackrabbit directory.

```
cp ./jackrabbit/repository.xml ~/pentaho/server/data-integration-server/pentaho-solutions/system/jackrabbit/
```

10. Copy the **scripts** directory from `/data-integration-server-old/` directory to the new `data-integration-server` directory.



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

11. If you plan to connect to Hadoop, ensure that the **hadoop-core** JAR in your Hadoop cluster is the same version as the one Pentaho ships with PDI (in `/data-integration/libext/bigdata/`).

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

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

```
cp -r jre ~/pentaho/server/data-integration-server/
```

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

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

Your DI Server is now upgraded to version 4.3. Continue on to the next subsection to upgrade the Pentaho Enterprise Console.

## **javax.jcr.RepositoryException: no search manager configured for this workspace**

If you see this error in your PDI server log, then there was an error in the upgrade process from PDI 4.2.0 to 4.3. Specifically, the **SearchIndex** XML nodes were not properly modified. To fix this, refer to [Upgrading a Data Integration Server](#) on page 12 and closely follow the instructions for modifying repository configuration files.

## User Console Themes Render Improperly After Upgrade

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

# Upgrading the Pentaho Enterprise Console

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

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

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

2. Unpack the `pec-4.5.0-GA` zip or `tar.gz` file to `/pentaho/server/`.

```
tar zxvf ~/downloads/pec-4.5.0-GA.tar.gz -C /home/pentaho/pentaho/server/
```

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

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

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

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

This directory contains PDI-specific settings.

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

The Pentaho Enterprise Console has been upgraded to version 4.5.0.

# Upgrading a Data Integration Workstation

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Ensure that the Data Integration client tools (Spoon, Pan, Kitchen) are not running on the machine before proceeding.



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

Follow the directions below to upgrade your PDI workstations to version 4.3. Adjust the installation paths to match your scenario.

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

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

2. Unpack the **pdi-ee-client-4.3.0-GA** package to the same location that you just deleted.

```
cd /home/rwilco/pentaho/design-tools/ && tar zxvf ~/downloads/pdi-ee-client-4.3.0-GA.tar.gz
```

3. Start Data Integration and ensure that you can still connect to the DI Server (if you have an enterprise repository connection) and access all of your old content.

This workstation is now upgraded to PDI 4.3.0-GA. Repeat this procedure for other workstations that you have support entitlements for.



## Calculator Step Bug Fix

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In previous versions, the "Date A - Date B (working days)" function of the Calculator reversed the calculation and it was necessary to perform a workaround to address the incorrect values returned (link to previous workaround: <http://jira.pentaho.com/browse/PDI-6811>). Specifically, with the calculation "Date A - Date B (working days)" users were advised to reverse the calculation to get the correct values. Unfortunately, this fix was not applied to the "Date A - Date B (working days)" function of the Calculator, instead the "Date A - Date B" function was modified (details <http://jira.pentaho.com/browse/PDI-7994>).



**Note:** After upgrading to version 4.3, the calculation used to perform the workaround now returns incorrect values. Any instance where the calculation "Date A - Date B (working days)" and "Date A - Date B (working days)" was used should be verified. A patch that fixes both calculation functions to the correct values is available for customers upon request via the customer support portal and will be incorporated into the next GA release of PDI.

## Testing and Cleanup

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You should now have a complete PDI 4.3 environment, from the DI Server to individual client workstations. Before you go back into production, you should perform the following tests:

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

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