Oracle® Communications Billing and Revenue Management

PDC Installation Guide



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About This Content

This guide provides instructions for installing and administering Oracle Communications Pricing Design Center (PDC).

Audience

This document is intended for system administrators, database administrators, and developers who install and configure PDC.

Before reading this guide, you should have familiarity with PDC. See *PDC Creating Product Offerings* for more information.

PDC requires Oracle Database and Oracle WebLogic Server. See the documentation for those products for installation and configuration instructions.

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Part I
Getting Started

This part provides an overview of the Oracle Communications Pricing Design Center (PDC) installation and includes the system requirements for installing or upgrading the software. It contains the following chapters:

- Pricing Design Center Installation Overview
- Pricing Design Center System Requirements

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1

Pricing Design Center Installation Overview

Learn about the procedures for installing and upgrading Oracle Communications Pricing Design Center (PDC).

Topics in this document:

- Overview of the PDC Installation Procedure
- Overview of the PDC Upgrade Procedure
- Ensuring a Successful PDC Installation

Overview of the PDC Installation Procedure

The following is an outline of the installation procedure for the PDC software:

1. Plan your installation. Planning your installation involves:
   - Determining the scale of your implementation (for example, is it a small test system or a large production system?)
   - Assessing how many physical computers you need and which software components to install on which computers
   - Planning the system topology
2. Review system requirements.
3. Perform the following preinstallation tasks:
   - Install and configure Oracle Database
   - Install and configure Oracle WebLogic Server
   - Install and configure Oracle Communications Billing and Revenue Management (BRM)
   - Install Java Runtime Environment (JRE)/Java Development Kit (JDK)
4. Install the complete PDC software.
5. Perform the postinstallation configuration tasks.
6. Verify the installation.

Overview of the PDC Upgrade Procedure

The following is an outline of the procedure for the PDC upgrade:

1. Plan your upgrade.
2. Review system requirements.
3. Perform the following preinstallation tasks:
   - Shut down the current instance.
   - Back up your existing PDC installation.
   - Install a compatible version of ECE.

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- Install a compatible version of BRM.
- Upgrade the PDC database.

4. Install PDC in a different location on the machine on which the existing PDC installation is located.
5. Perform the postinstallation configuration tasks.
6. Verify the installation.

Ensuring a Successful PDC Installation

Oracle recommends that the installation and configuration of the Oracle database be performed by an experienced database administrator.

To ensure that the PDC installation is successful, follow these guidelines:

- As you install each component (for example, the Oracle Database and Oracle WebLogic Server), verify that the component installed successfully before continuing the installation process.
- Pay close attention to the system requirements. Before you begin installing the application, ensure that your system has the required base software. In addition, ensure that you know all the required configuration values, such as host names and port numbers.
- Make a note of any new configuration values as you create them. You will be required to enter configuration values later in the procedure.

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Pricing Design Center System Requirements

Learn about the software and hardware requirements for installing Oracle Communications Pricing Design Center (PDC).

Topics in this document:

- Software Requirements
- Hardware Requirements
- Information Requirements

Software Requirements

PDC is an application that is deployed in an Oracle WebLogic Server domain. You must install and connect all required software for optimal performance. For more information on the supported operating systems, additional software required, and compatible software versions, see *BRM Compatibility Matrix*.

Hardware Requirements

The number and configuration of the computers that you employ for your PDC installation depend on the scale and the kind of deployment you have planned according to your networks. Work with your performance team to determine your sizing requirements.

Information Requirements

This section describes the information that you will be required to provide during the PDC installation procedure. You define some of these configuration values when you install and configure Oracle Database and WebLogic Server.

> **Note**
>
> Oracle recommends that you print the tables and record the values for future reference.

The following types of information are required:

- PDC WebLogic Server Connection Information
- PDC Database Connection Information
- PDC Schema Information
- BRM Server Information
- BRM Pipeline Manager Database Information
- Transformation Cross-Reference Database Information

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- Transformation Cross-Reference Schema Information
- Migration Cross-Reference Database Information
- Migration Cross-Reference Schema Information

PDC WebLogic Server Connection Information

Table 2-1 lists the details for the WebLogic Server domain (the domain on which you deploy PDC) that are required during the PDC software installation.

Table 2-1 PDC WebLogic Server Connection Information

Field	Description	Value
Host Name	The IP address or the host name of the machine on which the WebLogic Server domain is configured.	-
Port Number	The port number assigned to the WebLogic Server domain administration server.	-
User Name	The WebLogic Server domain administrator user name.	-
Password	The WebLogic Server domain administrator user password.	-
WebLogic Home	The path of the directory in which the WebLogic Server software is installed. For example, *Middleware_home***/wlserver**, where *Middleware_home* is the directory in which the Oracle Middleware components are installed.	-

PDC Database Connection Information

Table 2-2 lists PDC database details that are required during the PDC software installation.

Table 2-2 PDC Database Connection Information

Field	Description	Value
Host Name	The IP address or the host name of the machine on which the PDC database is configured.	-
Port Number	The port number assigned to the PDC database service.	-
User Name	The PDC database user name. This user should have the following capabilities on the PDC database: create user, grant any role, grant any privileges, select any table for Enterprise edition, and DBA for XE.	-
Password	The database user password.	-
Service Name	The name of the PDC database service.	-
Wallet Location	The directory in which the database wallet is located.	-
Wallet Type	The type of wallet, such as SSO and PKCS12.	-
Wallet Password	The database wallet password.	-

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PDC Schema Information

Table 2-3 lists the tablespace details that are required to create the PDC schema during the PDC software installation.

Table 2-3 PDC Schema Information

Field	Description	Value
PDC Tablespace	The name of the tablespace for the PDC schema. This field is case-sensitive.	-
Temp Tablespace	The name of the temporary tablespace for the PDC schema. This field is case-sensitive.	-

BRM Server Information

Table 2-4 lists the BRM server details that are required during the PDC BRM Integration Pack installation.

Table 2-4 BRM Server Information

Field	Description	Value
BRM	The path to the directory in which BRM is installed. The path is defined in the $PIN_HOME environment variable.	-
BRM Pipeline	The path to the directory in which Pipeline Manager is installed. The path is defined in the $IFW_HOME environment variable.	-
Perl Home	The path to the directory in which the Perl libraries are installed.	-

BRM Pipeline Manager Database Information

Table 2-5 lists the Pipeline Manager database details that are required during the PDC BRM Integration Pack installation.

Table 2-5 BRM Pipeline Database Information

Field	Description	Value
Host Name	The IP address or the host name of the machine on which the BRM pipeline database is configured.	-
Port Number	The port number assigned to the BRM pipeline database service.	-
User Name	The BRM pipeline database schema user name.	-
Password	The BRM pipeline database schema user password.	-
Service Name	The name of the BRM pipeline database service.	-

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Table 2-5 (Cont.) BRM Pipeline Database Information

Field	Description	Value
Wallet Location	The directory in which the database wallet is located.	-
Wallet Type	Type of the wallet, such as SSO and PKCS12.	-
Wallet Password	The database wallet password.	-

Transformation Cross-Reference Database Information

Table 2-6 lists transformation cross-reference database details that are required during the PDC BRM Integration Pack installation.

Table 2-6 Transformation Cross-Reference Database Information

Field	Description	Value
Hostname	The IP address or the host name of the machine on which the transformation cross-reference database is configured.	-
Port number	The port number assigned to the transformation cross-reference database service.	-
User name	The transformation cross-reference database user name. This user should have the following capabilities on the transformation cross-reference database: create user, grant any role, grant any privileges, select any table for Enterprise edition, and DBA for XE.	-
Password	The transformation cross-reference database user password.	-
Service Name	The name of the transformation cross-reference database service.	-
Wallet Location	The directory in which the database wallet is located.	-
Wallet Type	Type of the wallet, such as SSO and PKCS12.	-
Wallet Password	The database wallet password.	-

Transformation Cross-Reference Schema Information

Table 2-7 lists the tablespace details that are required to create the transformation cross-reference schema during the PDC BRM Integration Pack installation.

Table 2-7 Transformation Cross-Reference Schema Information

Field	Description	Value
PDC Tablespace	The name of the PDC tablespace for the transformation cross-reference schema. This field is case-sensitive.	-

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Table 2-7 (Cont.) Transformation Cross-Reference Schema Information

Field	Description	Value
Temp Tablespace	The name of the temporary tablespace for the transformation cross-reference schema. This field is case-sensitive.	-

Migration Cross-Reference Database Information

Table 2-8 lists the migration cross-reference database details that are required during the PDC BRM Integration Pack installation.

> **Note**
>
> The migration cross-reference database details are required only if you want to migrate pricing and setup components from the BRM database to the PDC database.

Table 2-8 Migration Cross-Reference Database Information

Field	Description	Value
Host Name	The IP address or the host name of the machine on which the migration cross-reference database is configured.	-
Port Number	The port number assigned to the migration cross-reference database service.	-
User Name	The migration cross-reference database user name.	-
Password	The migration cross-reference database user password.	-
Service Name	The name of the migration cross-reference database service.	-
Wallet Location	The directory in which the database wallet is located.	-
Wallet Type	Type of the wallet, such as SSO and PKCS12.	-
Wallet Password	The database wallet password.	-

Migration Cross-Reference Schema Information

Table 2-9 lists the tablespace details that are required to create the migration cross-reference schema during PDC BRM Integration Pack installation.

> **Note**
>
> The migration cross-reference schema details are required only if you want to migrate price lists from the BRM database to the PDC database.

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Table 2-9 Migration Cross-Reference Schema Information

Field	Description	Value
PDC Tablespace	The name of the PDC tablespace for the migration cross-reference schema. This field is case-sensitive.	-
Temp Tablespace	The name of the temporary tablespace for the migration cross-reference schema. This field is case-sensitive.	-

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Part II
Installing Pricing Design Center

This part describes how to set up and install Oracle Communications Pricing Design Center (PDC).

> **Note**
>
> Do not use the instructions in this part if you are upgrading PDC. Use the instructions in this part "Upgrading Pricing Design Center".

This part contains the following chapters:

- Pricing Design Center Preinstallation Tasks
- Installing Pricing Design Center
- Pricing Design Center Postinstallation Tasks

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3

Pricing Design Center Preinstallation Tasks

Learn about prerequisite tasks, such as installing and configuring the database, that you perform before installing Oracle Communications Pricing Design Center (PDC) for the first time.

Before installing PDC for the first time, do the following:

1. Install and configure Oracle Database. See "Installing and Configuring Oracle Database".
2. Install Java Runtime Environment (JRE)/Java Development Kit (JDK). See "Installing JRE/JDK".
3. Install and configure Oracle WebLogic Server. See "Installing and Configuring Oracle WebLogic Server".
4. Set the JAVA_HOME environment variable. See "Setting the JAVA_HOME Environment Variable".
5. Enable JRE permissions. See "Enabling JRE Permissions".
6. Install the compatible version of BRM on the machine on which you will install PDC BRM Integration Pack. See "Installing BRM" in *BRM Installation Guide*.

   See *BRM Compatibility Matrix* for the compatible version of BRM.
7. Enable integration between BRM and PDC. See "Enabling BRM-PDC Integration".

Installing and Configuring Oracle Database

Oracle recommends that the installation and configuration of Oracle Database be performed by an experienced database administrator. To install and configure Oracle Database, see the Oracle Database installation documentation.

When you install the software, do the following:

- Install Oracle Database Enterprise Edition.
- Create the PDC database.
- Create a database to store the transformation cross-reference tables, or use the PDC database to store the transformation cross-reference tables.
- Create a database to store the migration cross-reference tables, or use the PDC database or the transformation cross-reference database to store the migration cross-reference tables.
- (Optional) Create PDC tablespaces and temporary tablespaces for the following:
  - The PDC schema, to store the pricing and setup components.
  - The transformation cross-reference schema, to store tables that map pricing and setup components in PDC to the corresponding component in a target rating engine.
  - The migration cross-reference schema, to store tables that map the pricing and setup components that are migrated from the BRM database to the corresponding component in a target rating engine.

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Oracle recommends that you create separate PDC tablespaces and temporary tablespaces for each schema. However, you can use a single PDC tablespace and temporary tablespace to create all the schemas.

Setting the Database Time Zone

The PDC database must have the appropriate local time zone setting.

For more information on setting the time zone, see the *Oracle Database Globalization Support Guide*.

> **Note**
>
> Ensure that the BRM database and the PDC database are in the same time zone.
>
> After PDC has been installed, the database time zone cannot be changed. Ensure the time zone is correctly set before installing PDC.

Tuning the Database

Table 3-1 and Table 3-2 provide recommended database parameters for tuning your database for the PDC installation. These are the minimum requirements for PDC.

Table 3-1 Database Creation Parameters

Parameter	Recommended Value
SGA+PGA	At least 4 GB in total. Oracle recommends that you use as much memory as you have available in the machine, and also use Automatic Memory Management.
Processes	2000
Connection mode	Dedicated server
Redo log file size	1024 MB minimum

Table 3-2 Database Initialization Parameters

Parameter	Recommended Value
db_file_multiblock_read_count	16
distributed_lock_timeout	7200
dml_locks	9700
job_queue_processes	10
log_buffer	31457280
open_cursors	5000
parallel_max_servers	640
plsql_code_type	NATIVE

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Configuring SSL for the PDC Database

You can configure secure sockets layer (SSL) for the Oracle database by creating wallets for storing certificates and then modifying the following configuration files:

- **sqlnet.ora**
- **tnsnames.ora**
- **listener.ora**

You can use the **Orapki** utility to create the wallets.

For information about configuring SSL for the Oracle database, see the Oracle Database documentation.

Installing JRE/JDK

Install the recommended version of JRE/JDK on the machine on which you want to deploy PDC. See *BRM Compatibility Matrix* for the recommended version of JRE/JDK.

To verify the JRE/JDK version:

1. Go to the command prompt on the machine on which you want to deploy PDC.
2. Enter the following command:

   ```
   java -version
   ```

   The Java version is displayed.

   The version displayed should be the recommended version from the *BRM Compatibility Matrix*.

For information about installing JRE/JDK, see the Oracle Java documentation.

Installing and Configuring Oracle WebLogic Server

This section describes procedures relating to installing Oracle WebLogic Server and configuring the WebLogic Server domain in which you will deploy PDC.

See the information in the following sections:

1. Downloading and Installing Oracle WebLogic Server
2. Copying Library JAR Files for PDC Installation
3. Installing Oracle Application Development Runtime
4. Creating the Oracle WebLogic Server Domain
5. Configuring SSL for the WebLogic Server Domain
6. Configuring the SSL Protocol Version
7. Enabling TLS in PDC REST Services Manager
8. Setting the JDBC Path for the WebLogic Server Domain
9. Configuring WebLogic Server to use SSL-Enabled Data Source
10. Updating JDBC LLR Table Name

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Downloading and Installing Oracle WebLogic Server

WebLogic Server is a component of the Oracle Fusion Middleware media pack. For the compatible version of WebLogic Server, see *BRM Compatibility Matrix*.

For information on installing Oracle WebLogic Server and the patches (if any), see the Oracle WebLogic Server documentation on the Oracle Help Center:

http://docs.oracle.com

Copying Library JAR Files for PDC Installation

Copy the needed jar files to your PDC implementation.

1. Copy the following files to a directory on your PDC system:
   - The **ojdbc8.jar** file from your Oracle database installation
   - *Middleware_home*/**jlib/oraclepki.jar**
   - *Middleware_home*/**oracle_common/modules/oracle.osdt/osdt_cert.jar**
   - *Middleware_home*/**oracle_common/modules/oracle.osdt/osdt_core.jar**

   where *Middleware_home* is the ORACLE_HOME directory of your WebLogic Server installation.
2. If you will be installing the BRM Integration Pack, copy the following files to a directory on the system where you will be installing the BRM Integration Pack:
   - The **ojdbc8.jar** file from your Oracle database installation
   - *Middleware_home*/**jlib/oraclepki.jar**
   - *Middleware_home*/**oracle_common/modules/com.sun.xml.bind.jaxb-impl.jar**
   - *Middleware_home*/**oracle_common/modules/jakarta.activation-1.2.2.jar**
   - *Middleware_home*/**oracle_common/modules/jakarta.jms-api-2.0.2.jar**
   - *Middleware_home*/**oracle_common/modules/jakarta.xml.bind-api-2.3.3.jar**
   - *Middleware_home*/**oracle_common/modules/jaxb-impl-2.3.5-b230912.1728.jar**
   - *Middleware_home*/**oracle_common/modules/oracle.igf/identitydirectory.jar**
   - *Middleware_home*/**oracle_common/modules/oracle.jps/jps-api.jar**
   - *Middleware_home*/**oracle_common/modules/oracle.nlsrtl/orai18n.jar**
   - *Middleware_home*/**oracle_common/modules/oracle.nlsrtl/orai18n-collation.jar**
   - *Middleware_home*/**oracle_common/modules/oracle.osdt/osdt_cert.jar**
   - *Middleware_home*/**oracle_common/modules/oracle.osdt/osdt_core.jar**
   - *Middleware_home*/**oracle_common/modules/oracle.xdk/xml.jar**
   - *Middleware_home*/**oracle_common/modules/oracle.xdk/xmlparserv2.jar**
   - *Middleware_home*/**wlserver/modules/jakarta.transaction-api-1.3.2.jar**
   - *Middleware_home*/**wlserver/server/lib/wlnmclient.jar**
   - *Middleware_home*/**wlserver/server/lib/wlthint3client.jar**
3. During the PDC and BRM Integration Pack installation processes, the installer will prompt you for the directory in which your prerequisite libraries are located. If you are installing

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both PDC and the BRM Integration Pack on the same system, you will be prompted for both directories during installation. You will need to enter the path that you copied the JAR files to.

Installing Oracle Application Development Runtime

Oracle Application Development Runtime must be installed on the machine on which you will install PDC. For more information on the compatible version, see *BRM Compatibility Matrix*.

Download Oracle Application Development Runtime from the following page:

https://www.oracle.com/tools/downloads/application-development-framework-downloads.html

For information on installing Oracle Application Development Runtime, see *Oracle Fusion Middleware Installation Guide* for the appropriate version.

> **Note**
>
> The Oracle Fusion Middleware Application Developer Installer installs Oracle Application Development Runtime and Oracle Enterprise Manager.

Creating the Oracle WebLogic Server Domain

Before creating a WebLogic Server domain, use the Oracle Fusion Middleware Repository Creation Utility (RCU) to create the required Oracle Identity and Access Management (IAM) database schema. See *Fusion Middleware Repository Creation Utility User's Guide* for more information on RCU.

To create a WebLogic Server domain in which to deploy PDC, see the description of using the Configuration Wizard in the Oracle WebLogic Server documentation. You can use the Configuration Wizard in graphical mode or console mode.

> **Note**
>
> If you are migrating the PDC pricing data from a source PDC system to a target PDC system that supports ECE, ensure that you create the WebLogic Server domain for the target PDC system on the same machine on which the WebLogic Server domain for the source PDC system exists.

Table 3-3 shows the values to choose when creating the WebLogic Server domain for PDC.

Create the WebLogic Server domain with at least one managed server configured along with the administration server because Oracle recommends that you deploy PDC on a managed server in the production environment.

Table 3-3 Oracle WebLogic Server Domain Configuration Values

Configuration Value	Description
Domain source	Select **Generate a domain configured automatically to support the following products**. From the list, select **Oracle JRF - 14.1.2.0 [oracle_common]**.

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Table 3-3 (Cont.) Oracle WebLogic Server Domain Configuration Values

Configuration Value	Description
Domain Mode Configuration	Select **Production Mode**.
JDK Selection	From the **Available JDKs** list, select the JDK version required for installing PDC. For more information, see *BRM Compatibility Matrix*.
Optional Configuration	Select the following: • **Administration Server**. Select this option to configure the Oracle WebLogic Server domain administration server. • (Optional) **Managed Servers, Clusters and Machines**. Select this option if you want to configure only WebLogic Server domain managed servers or machines that host WebLogic servers. **Note:** PDC does not support WebLogic cluster deployment. • (Optional) **Deployments and Services**. Select this option if you want to target your deployments to servers.
Administration Server Listen Address	Use a listen address that is equal to a resolvable DNS host or IP address.
Administration Server Listen Port	Enter a free port number.
Managed Server Listen Address	(Optional) Enter a listen address that is equal to a resolvable DNS host or IP address.
Managed Server Listen Port	(Optional) Enter a free port number.
Target Deployments to Clusters or Servers	(Optional) Add all libraries to the managed server target and to the administration server.
Target Services to Clusters or Servers	(Optional) Add all services to the managed server target.
SSL Listen Port Enabled	Select the **SSL Listen Port Enabled** check box.
SSL Listen Port	Enter a free port number.

See *Oracle Fusion Middleware Installation Guide for Oracle Enterprise Content Management Suite* for the appropriate version to see more information on WebLogic Server domains.

You can now start the administration server manually and log in to the WebLogic Remote Console.

Configuring SSL for the WebLogic Server Domain

If you want to enable secure communication for PDC, you must configure SSL for the WebLogic Server domain in which you deploy PDC.

To configure SSL for the WebLogic Server domain:

1. Generate the server-side KeyStore file by using the recommended version of the JRE/JDK **keytool** utility. See *Key and Certificate Management Tool* for more information.
2. Export the public certificate from the server-side KeyStore file by using the recommended version of the JRE/JDK **keytool** utility. See *Key and Certificate Management Tool* for more information.
3. Generate the client-side KeyStore file from the exported public certificate by using the recommended version of the JRE/JDK **keytool** utility. See *Key and Certificate Management Tool* for more information.

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> **Note**
>
> Note the path of the client-side KeyStore file. You need to provide this path during the PDC installation if you choose to use SSL.
>
> If you are installing PDC and BRM Integration Pack on different machines, copy the client-side KeyStore file to the machine on which you want to install BRM Integration Pack.

4. Configure SSL for the server on which you want to deploy PDC in WebLogic Remote Console. See the Securing Domains for more information.
5. Enable Java Secure Socket Extension-based SSL for the server on which you want to deploy PDC in WebLogic Remote Console. See the Securing Domains for more information.

Configuring the SSL Protocol Version

In a production environment, Oracle recommends using the SSL protocol for sending and receiving messages.

> **Note**
>
> You need to set the same protocol version for managed servers and the administration server. Ensure that all the managed servers are down when making changes to the administration server for setting up the protocol. Oracle recommends to set the properties in the administration server and then the managed server.

When PDC is acting as a server, you can set the minimum protocol version of TLS to be used by specifying the following as a command-line option in the WebLogic Server startup parameters.

You can set the minimum version to TLS 1.2 using this command:

```
-Dweblogic.security.SSL.minimumProtocolVersion=TLSv1.2
```

You can set the minimum version to TLS 1.3 using this command:

```
-Dweblogic.security.SSL.minimumProtocolVersion=TLSv1.3
```

> **Note**
>
> When you set a minimum protocol version, the TLS protocol that is enabled depends on the protocols that are configured in the SSL implementation.

WebLogic Server supports both TLS 1.2 and TLS 1.3 by default when PDC is acting as a client, so no configuration is necessary to set that value.

See "Specifying the SSL/TLS Protocol Version" in *Administering Security for Oracle WebLogic Server* for more information.

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Enabling TLS in PDC REST Services Manager

To use TLS 1.3 with the PDC REST Services Manager, you must configure a server certificate and a PKCS12 keystore. The following procedure uses a self-signed certificate. For production environments, use a certificate issued by a trusted certificate authority (CA) when possible.

To enable TLS 1.3 in PDC REST Services Manager:

1. Log in as the operating-system user that runs PDC REST Services Manager. Create a directory to contain the certificate and private key, for example, *PDC_RSM_home*/**rsm_cert**. Run the following commands to restrict access to the directory:

   ```
   umask 077
   mkdir -p "$PDC_RSM_home/rsm_cert"
   chmod 700 "$PDC_RSM_home/rsm_cert"
   ```

2. Change to the new directory and generate a self-signed certificate. You can use an OpenSSL command such as the following:

   ```
   cd "$PDC_RSM_home/rsm_cert"
   openssl req -x509 -newkey rsa:4096 -keyout openSSLKey.pem -out cert.pem -days 365 \
       -nodes -addext "subjectAltName=DNS:DNSname"
   ```

   where *DNSname* is the DNS name that clients use to connect to PDC REST Services Manager.

   > ⚠ **Caution**
   >
   > The **-nodes** option generates an unencrypted private key in **openSSLKey.pem**. Ensure that the file is owned by the PDC REST Services Manager operating-system user and is not accessible to other users. Do not distribute or expose the private key.

   See "openssl-req" in the OpenSSL documentation for more information about the OpenSSL **req** command.

3. Restrict access to the private key:

   ```
   chmod 600 openSSLKey.pem
   ```

4. Generate a PKCS12 keystore file. For example, the following command creates a keystore file named **keystore.p12**:

   ```
   openssl pkcs12 -export -out keyStore.p12 -inkey openSSLKey.pem -in cert.pem
   ```

   When prompted, enter a strong keystore password.

   See "openssl-pkcs12" in the OpenSSL documentation for more information about the OpenSSL **pkcs12** command.

5. Restrict access to the keystore:

   ```
   chmod 600 keystore.p12
   ```

6. Ensure that the RSM AES master password is loaded into the process environment. See "Configuring the PDC REST Services Manager AES Master Password".

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7. Change to the *PDC_RSM_home***/apps/bin** directory and generate the hashed keystore passphrase using the following command:

   ```
   RestServicesManager.sh hash
   ```

   Enter the password that you specified when generating the PKCS12 keystore file.

   > **Note**
   >
   > If you get the error: "Error: Could not find or load main class io.helidon.config.encryption.Main," update the version of **helidon-config-encryption.jar** in the **hash** method in the **RestServicesManager.sh** file.

8. Add **ssl-protocols**, **keystore-path** and **keystore-passphrase** in the **application.yaml** file. For example:

   ```
   server:
     ...
     ssl-protocols:
       - "TLSv1.2"
       - "TLSv1.3"
     ssl:
       private-key:
         keystore-path: "file_path/keystore.p12"
         keystore-passphrase: "${passPhrase}"
   ```

   where *file_path* is the path to the keystore file and *passphrase* is the hashed passphrase you created using **RestServicesManager.sh**.

   See "PDC REST Services Manager Security" in *Security Guide* for more information about the **application.yaml** file.

> **Note**
>
> Self-signed certificates are not automatically trusted by clients. If you use a self-signed certificate in a production environment, configure each client to trust the public certificate (**cert.pem**) in its appropriate trust store. Verify the certificate's authenticity before importing it, and ensure that the DNS name used by the client matches the certificate's Subject Alternative Name (SAN).
>
> Do not disable certificate verification to establish the TLS connection. For production deployments, a CA-issued certificate is recommended where possible.

Setting the JDBC Path for the WebLogic Server Domain

You must obtain the **ojdbc8.jar** file and set the path to this file for the WebLogic Server domain.

To set the JDBC path for the WebLogic Server domain:

1. Download the **ojdbc8.jar** file and copy it to the *Domain_home***/lib** directory, where *Domain_home* is the directory in which the WebLogic Server domain is created.

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> **Note**
>
> Ensure that you download a compatible version of **ojdbc8.jar** for your database and Java environment.

You can download this file from:

https://www.oracle.com/database/technologies/appdev/jdbc-downloads.html

2. Open the *Domain_home*/**bin/setDomainEnv.sh** file in a text editor.
3. Add or modify the following lines to include **ojdbc8.jar** in the CLASSPATH environment variable:

```
CLASSPATH=${Domain_home}/lib/ojdbc8.jar:${CLASSPATH}
export CLASSPATH
```

4. Save and close the file.

Configuring WebLogic Server to use SSL-Enabled Data Source

You can use the Secure Sockets Layer (SSL)-enabled data source in Oracle WebLogic Server for secured communications.

You must configure WebLogic Server before configuring the data sources. For more information on configuring WebLogic Server, see the discussion about using SSL with data sources and Oracle drivers in the Oracle WebLogic Server documentation and in the following page:

https://www.oracle.com/middleware/technologies/weblogic/configure-use-jdbcdriverssl.html

Updating JDBC LLR Table Name

If you are using an existing database schema during installation, the Logging Last Resource (LLR) table name must be changed to avoid errors.

To change the LLR table name:

1. Log in to WebLogic Remote Console.
2. Click **Edit Tree**, then **Environment,** and then **Servers**.

   The Summary of Servers page appears.
3. In the Servers table, click the server for which you want to change the LLR table name.
4. Click the **General** subtab.
5. Select **Show Advanced Fields** to show the advanced options.
6. Set **JDBCLLR Table Name** to a different name.
7. Click **Save**.
8. Click the shopping cart at the top right, and then click **Commit Changes** to commit your changes.

For more information on LLR, see the discussion about administrative considerations and limitations for LLR data sources in the WebLogic Server documentation.

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Setting the JAVA_HOME Environment Variable

Set the **JAVA_HOME** environment variable to the recommended version of JRE/JDK before running any PDC processes. See *BRM Compatibility Matrix* for the recommended version of JRE/JDK.

Set the **JAVA_HOME** environment variable on the machine on which you want to deploy PDC. For example, in C-shell:

1. Open the **.cshrc** file in a text editor.
2. Add or modify the following entries:

   ```
   setenv JAVA_HOME jre/jdk_path
   ```

   where *jre/jdk_path* is the absolute path to the directory in which JRE/JDK is installed.
3. Save and close the file.
4. Update the environment by running the following command:

   ```
   source .cshrc
   ```
5. Verify the Java version by running the following command:

   ```
   $JAVA_HOME/bin/java -version
   ```

   The Java version is displayed.

To set the JAVA_HOME environment variable for the WebLogic Server domain:

1. Open the *Domain_home***/bin/setDomainEnv.sh** file in a text editor.
2. Add or modify the following entries before the **EXTRA_JAVA_PROPERTIES** entry:

   ```
   JAVA_HOME="${JAVA_HOME}"
   export JAVA_HOME
   ```
3. Save and close the file.

Enabling JRE Permissions

To enable JRE permissions:

1. Go to the *jre/jdk_path***/lib/security** directory.
2. Open the **java.policy** file in a text editor.
3. Add the following entries to the file:

   ```
   grant { // JMX Java Management eXtensions
             permission javax.management.MBeanTrustPermission "register";
   };
   ```
4. Save and close the file.

Enabling BRM-PDC Integration

After installing BRM, enable the BRM-PDC integration in BRM. This enables PDC to transform and transfer pricing components configured in PDC to BRM.

To enable the BRM-PDC integration:

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1. Go to *BRM_home*/**sys/data/config** and run the following command, which creates an editable XML file from the pricing instance of the **/config/business_params** object, where *BRM_home* is the directory in which BRM is installed.

   ```
   BRM_home/bin/pin_bus_params -r BusParamsPricing bus_params_pricing.xml
   ```

   This directory includes the support files used by the **pin_bus_params** utility. To run it from a different directory, see the discussion about the **pin_bus_params** utility in the BRM documentation.

   This command creates the XML file named **bus_params_pricing.xml.out** in your working directory. If you do not want this file in your working directory, specify the path as part of the file name.

2. Search the **bus_params_pricing.xml.out** file for the following line:

   ```
   <PriceDesignCenterInst>disabled</PriceDesignCenterInst>
   ```

3. Change **disabled** to **enabled**.

4. Save the file as **bus_params_pricing.xml**.

5. Run the following command, which loads the updated file into the **/config/business_params** object:

   ```
   BRM_home/bin/pin_bus_params bus_params_pricing.xml
   ```

6. Read the object with the **testnap** utility or Object Browser to verify that all fields are correct. See "Reading Objects" in *BRM Developer's Guide*.

7. Stop and restart the Connection Manager (CM).

   For more information, see "Starting and Stopping the BRM System" in *BRM System Administrator's Guide*.

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4

Installing Pricing Design Center

Learn how to install one or more of the following Oracle Communications Pricing Design Center (PDC) components: the PDC software, Oracle Communications Billing and Revenue Management (BRM) Integration Pack, or PDC REST Services Manager.

Topics in this document:

- About the PDC Installer and PDC Schema
- About Installing PDC
- Downloading the PDC Software
- Installing PDC in GUI Mode
- Installing PDC in Silent Mode
- About Installation Logs

About the PDC Installer and PDC Schema

The PDC installer provides the option to install the PDC software, BRM Integration Pack, PDC REST Services Manager, or all three PDC components. For more information about these components, see "PDC System Architecture" in *BRM Concepts*.

The PDC installer also allows you to create a new PDC database schema or reuse your existing PDC database schema. It determines whether to create or reuse the schema by checking the PDC tablespace you provide during the installation process:

- If you point to an empty PDC tablespace, the installer creates a new PDC schema.
- If you point to a PDC tablespace with an existing schema, the installer validates the PDC schema. If the validation succeeds, PDC reuses the existing PDC schema.

> **Note**
>
> If you choose to reuse an existing PDC schema, you must also choose the same rating engine as the existing PDC installation. That is, if your existing PDC installation uses Elastic Charging Engine (ECE) for usage rating, you cannot switch to the Realtime Rating and Batch Rating Engines. Likewise, if your existing PDC installation uses the Realtime Rating and Batch Rating Engines for usage rating, you cannot switch to ECE. If you attempt to switch rating engines, the PDC installer generates an error and prevents you from continuing the installation.

About Installing PDC

You can install PDC in GUI mode or silent mode. Installing PDC in silent mode lets you perform a non-interactive install of PDC. You can use the silent mode to install PDC quickly.

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PDC installation must be performed by a user who has permissions to write to the **oraInventory** directory and the *Middleware_home***/user_projects/domains** directory, where *Middleware_home* is the directory in which the Oracle Middleware components are installed.

Downloading the PDC Software

You can download the PDC software from one of the following locations:

- For PDC 16.26.0.0 or any 16.26.0.*x* maintenance release: From the Oracle software delivery website (https://edelivery.oracle.com)
- For any 16.26.0.*x*.*y* patch set release: From the Oracle support website (https://support.oracle.com)

Search for and download the **Oracle Communications Pricing Design Center 16.26.0.*x*.*y*.0** software, where *x* refers to the maintenance release and *y* refers to the patch set release of PDC that you are installing.

The Zip archive includes the installer: **pdcserver-16.26.0.*x*.*y*.0_generic_full.jar**.

Installing PDC in GUI Mode

The steps for installing PDC by using the GUI depend on the PDC components you choose to install:

- To install all PDC components, including the PDC software, BRM Integration Pack, and PDC REST Services Manager, select the **Complete** installation option. See "Installing All PDC Components".
- To install only the PDC software, select the **Pricing Design Center** installation option. See "Installing Only the PDC Software".
- To install only BRM Integration Pack, select the **BRM Integration Pack** installation option. See "Installing Only BRM Integration Pack".
- To install only PDC REST Services Manager, select the **PDC REST Services Manager** option. See "Installing Only PDC REST Services Manager".

Installing All PDC Components

To install the PDC software, BRM Integration Pack, and PDC REST Services Manager on the same machine:

1. Obtain the PDC software. See "Downloading the PDC Software".
2. Start the Oracle WebLogic Server domain administration server or the WebLogic Server domain managed server on which you want to deploy PDC, if it is not already started.
3. Ensure that the PDC database is running.

> **Note**
>
> Ensure that the Oracle Database server is in Running state. The Installer connects to the Oracle Database server to verify the information you entered is valid.

4. Go to the *temp_dir* directory, and run one of the following commands:
   - To start the GUI installer:

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```
Java_home/bin/java -jar jarfile
```

where:

- *Java_home* is the directory in which you installed the latest supported Java version.
- *jarfile* is the PDC installer file, for example **pdcserver-16.26.0.0.0_generic_full.jar**.

- To start the GUI installer and install PDC using the **oraInventory** directory in a different location:

  ```
  Java_home/bin/java -jar jarfile -invPtrLoc Inventory_home/oraInst.loc
  ```

  where *Inventory_home* is the location of the Oracle inventory.

- To start the GUI installer and create a silent installer response file during the installation:

  ```
  Java_home/bin/java -jar jarfile -record -destinationFile path
  ```

  where *path* is the response file location and name.

The Welcome window appears.

5. Click **Next**.

   The Specify Inventory Directory and Credentials window appears if the **oraInst.loc** file is corrupt or not present. The default location of the **oraInventory** directory is in the **/etc/oraInst.loc** file.

   This window displays the path to the default inventory directory and the default operating system group name.

6. (Optional) To change the default inventory directory details, do the following:
   a. Enter the full path of the inventory directory.
   b. Specify the name of the operating system group that has write permission to the inventory directory.
7. Click **Next**.

   The Installation Location window appears.

8. Enter the full path or browse to the directory in which to install PDC.
9. Click **Next**.

   The Installation Type window appears.

10. Select **Complete** and click **Next**.

    The PDC Pre-requisite Libraries Location window appears.

11. In the **Prerequisite library location** field, enter the full path or browse to the directory in which you copied all of the PDC JAR files. See "Copying Library JAR Files for PDC Installation" for more information.
12. Click **Next**.

    The PDC WebLogic Server window appears.

13. Enter the following details for the WebLogic Server domain in which you want to deploy PDC:
    a. In the **Host Name** field, enter the IP address or the host name of the machine on which the WebLogic Server domain is configured.

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b. In the **Port Number** field, enter the port number assigned to the WebLogic Server domain administration server.

c. In the **User Name** field, enter the WebLogic Server domain administrator user name.

d. In the **Password** field, enter the WebLogic Server domain administrator user password.

e. In the **WebLogic Home** field, enter the path to the directory in which the WebLogic Server software is installed. For example, *Middleware_home***/wlserver**.

f. To enable secure communication for PDC, select the **Enable SSL? (Recommended)** check box, and in the **KeyStore Location** field, enter the path of the client-side KeyStore file generated from the exported public certificate using the **keytool** utility.

For more information, see "Configuring SSL for the WebLogic Server Domain".

g. To allow the import and export of large XML files into PDC, select **Apply WebLogic tuning parameters**. For information about the WebLogic tuning parameters, see the installer Help.

> **Note**
>
> If you select this check box, you must restart the WebLogic Server domain after PDC installs successfully.

14. Click **Next**.

The WebLogic Server/Cluster window appears.

15. Do one of the following:

- To deploy PDC on a WebLogic Server domain administration server, select a WebLogic Server domain administration server from the list.
- To deploy PDC on a WebLogic Server domain managed server, select a WebLogic Server domain managed server from the list.

> **Note**
>
> Oracle recommends that you deploy PDC on a WebLogic Server managed server. If you select a WebLogic Server managed server, ensure that the WebLogic Server managed server and the node manager are running.

16. Click **Next**.

The PDC Wallet Location and Password window appears.

17. Enter the following details for the PDC wallet:

a. In the **Wallet Location** field, enter the path to the directory in which the PDC wallet is located or is to be installed.

b. In the **Wallet Password** field, enter the PDC wallet password.

c. In the **Confirm Wallet Password** field, enter the PDC wallet password again.

18. Click **Next**.

The Pricing Design Center Schema User window appears.

19. Do one of the following:

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- If you want to create a PDC schema user during installation, select **Yes** and proceed to step 20.
- If you want to use an existing PDC schema user, select **No** and proceed to step 24.

20. Click **Next**.

    The Pricing Design Center System Database Connection window appears.

21. Enter the following information required to connect to the PDC database:

    a. In the **Host Name** field, enter the IP address or the host name of the machine on which the PDC database is configured.

    b. In the **Port Number** field, enter the port number assigned to the PDC database service.

    > **Note**
    >
    > If the database is SSL-enabled, enter the SSL port number in the **Port Number** field.

    c. In the **User Name** field, enter the PDC database user name.

    This user should be the SYSDBA user or should have the following capabilities on the PDC database: grant create user, grant any role, grant any privileges, select any table to *username*, and grant sysdba to *username*.

    d. In the **Password** field, enter the PDC database user password.

    e. In the **Service Name** field, enter the name of the PDC database service.

    > **Note**
    >
    > Ensure that the Oracle Database server is in Running state. The Installer connects to the Oracle Database server to verify the information you entered is valid.

    f. From the **SSL** list, select the type of SSL connection required for connecting to the PDC database:

    - **No**: SSL authentication is not required.
    - **Yes-One Way**: One-way SSL authentication is required. In this case, the client must authenticate the server's identity.
    - **Yes-Two Way**: Two-way SSL authentication is required. In this case, both the client and server must authenticate each others identity.

    g. If you selected **Yes-One Way** or **Yes-Two Way**, do the following:

    - From the **Wallet Type** list, select the type of wallet to use for secure communication with the database: **SSO** or **PKCS12**.
    - In the **Truststore Wallet Location** field, enter the full path to the directory in which the database wallet is located.
    - In the **Truststore Wallet Password** field, enter the TrustStore wallet password to be used for secure communication.
    - In the **Keystore Wallet Location** field, enter the full path or browse to the directory in which the database wallet is located.

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- In the **Keystore Wallet Password** field, enter the KeyStore wallet password to be used for secure communication.

22. Click **Next**.

    The Pricing Design Center Schema window appears.

23. Enter the following information required to create the PDC schema in the PDC database and proceed to step 26:

    a. In the **User Name** field, enter a PDC schema user name.

    b. In the **Password** field, enter a PDC schema user password.

    c. In the **Confirm Password** field, enter the PDC schema user password again.

    d. In the **PDC Tablespace** field, enter the name of the tablespace for the PDC schema.

    e. In the **Temp Tablespace** field, enter the name of the temporary tablespace for the PDC schema.

    > **Note**
    >
    > If you point to a PDC tablespace with an existing schema, the installer validates the PDC schema. If the validation succeeds, PDC re-uses the existing PDC schema. If you point to an empty PDC tablespace, the installer creates a new PDC schema.

24. Click **Next**.

    The Pricing Design Center Schema window appears.

25. Enter the following information required to connect to a PDC database for an existing PDC user:

    a. In the **Host Name** field, enter the IP address or the host name of the machine on which the PDC database is configured.

    b. In the **Port Number** field, enter the port number assigned to the PDC database service.

    > **Note**
    >
    > If the database is SSL-enabled, enter the SSL port number in the **Port Number** field.

    c. In the **User Name** field, enter the PDC database user name.

    This user should be the SYSDBA user or should have the following capabilities on the PDC database: grant create user, grant any role, grant any privileges, select any table to *username*, and grant sysdba to *username*.

    d. In the **Password** field, enter the PDC database user password.

    e. In the **Service Name** field, enter the name of the PDC database service.

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> **Note**
>
> Ensure that the Oracle Database server is in Running state. The Installer connects to the Oracle Database server to verify the information you entered is valid.

f. From the **SSL** list, select the type of SSL connection required for connecting to the PDC database:

- **No**: SSL authentication is not required.
- **Yes-One Way**: One-way SSL authentication is required. In this case, the client must authenticate the server's identity.
- **Yes-Two Way**: Two-way SSL authentication is required. In this case, both the client and server must authenticate each others identity.

g. If you selected **Yes-One Way** or **Yes-Two Way**, do the following:

- From the **Wallet Type** list, select the type of wallet to use for secure communication with the database: **SSO** or **PKCS12**.
- In the **Truststore Wallet Location** field, enter the full path to the directory in which the database wallet is located.
- In the **Truststore Wallet Password** field, enter the TrustStore wallet password to be used for secure communication.
- In the **Keystore Wallet Location** field, enter the full path or browse to the directory in which the database wallet is located.
- In the **Keystore Wallet Password** field, enter the KeyStore wallet password to be used for secure communication.

26. Click **Next**.

    The Pricing Design Center System User window appears.

27. Enter the following information to create a PDC user to access the PDC GUI:

    a. In the **User Name** field, enter a PDC user name.

    b. In the **Password** field, enter a PDC user password.

> **Note**
>
> - The PDC user password can be a maximum of 12 characters long and should contain at least one non-alphabetic character.
> - The user name must not be a part of the password.

    c. In the **Confirm Password** field, enter the PDC user password again.

28. Click **Next**.

    The Select Charging Engine for Usage Rating appears.

29. Do one of the following:

- To use Oracle Communications Billing and Revenue Management (BRM) Elastic Charging Engine (ECE) for usage rating, select **Elastic Charging Engine**.

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- To use BRM real-time rating and batch rating engines for usage rating, select **Realtime Rating and Batch Rating Engines**.

> **Note**
>
> If you choose to reuse an existing PDC schema, you must also choose the same rating engine as the existing PDC installation. That is, if your existing PDC installation uses Elastic Charging Engine (ECE) for usage rating, you cannot switch to the Realtime Rating and Batch Rating Engines. Likewise, if your existing PDC installation uses the Realtime Rating and Batch Rating Engines for usage rating, you cannot switch to ECE. If you attempt to switch rating engines, the PDC installer generates an error and prevents you from proceeding with the installation process.

30. Click **Next**.

    The PDC Prerequisite Libraries Location window appears.

31. In the **Prerequisite library location** field, enter the full path or browse to the directory in which you copied all of the PDC JAR files. See "Copying Library JAR Files for PDC Installation" for more information.

32. Click **Next**.

    The Migration Option window appears.

33. Do one of the following:

    - If you do not want to migrate data, select **Do not install Migration Utility** and proceed to step 38.
    - To migrate the BRM real-time and batch rating engines pricing data to a PDC system that supports BRM real-time and batch rating engines, select **Migrate RRE and BRE Pricing Data to PDC** and proceed to step 38.
    - To migrate the BRM real-time and batch rating engines pricing data to a PDC system that supports ECE, select **Migrate RRE and BRE Pricing Data to PDC with ECE** and proceed to step 38.
    - To migrate the PDC pricing data to a PDC system that supports ECE, select **Migrate PDC Pricing Data to PDC with ECE** and continue with the next step.

34. Click **Next**.

    The Source WebLogic Administration Server Connection window appears.

35. If you are migrating the PDC pricing data to a PDC system that supports ECE, enter the following details for the WebLogic Server domain in which you deployed the source PDC system:

    a. In the **Host Name** field, enter the IP address or the host name of the machine on which the WebLogic Server domain for the source PDC system is configured.

    b. In the **Port Number** field, enter the port number assigned to the WebLogic Server domain administration server.

> **Note**
>
> If you selected a WebLogic Server domain managed server in step 15, enter the port number to the managed server.

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c. In the **User Name** field, enter the WebLogic Server domain administrator user name.

d. In the **Password** field, enter the WebLogic Server domain administrator user password.

e. In the **WebLogic Home** field, enter the path of the directory where the Oracle WebLogic Server software is installed.

f. Do one of the following:

- If you do not want to enable secure communication for PDC, deselect the **Enable SSL?** check box.
- To enable secure communication for PDC, leave the **Enable SSL?** check box selected, and in the **KeyStore Location** field, enter the path of the client-side KeyStore file generated from the exported public certificate using the **keytool** utility.

  For more information, see "Configuring SSL for the WebLogic Server Domain".

36. Click **Next**.

    The Target Pricing Design Center WebLogic Server Connection window appears.

37. If you are migrating the PDC pricing data to a PDC system that supports ECE, enter the following details for the WebLogic Server domain in which you deployed the target PDC system:

    a. In the **Host Name** field, enter the IP address or the host name of the machine on which the WebLogic Server domain for the target PDC system is configured.

    b. In the **Port Number** field, enter the port number assigned to the WebLogic Server domain administration server.

    c. In the **User Name** field, enter the WebLogic Server domain administrator user name.

    d. In the **Password** field, enter the WebLogic Server domain administrator user password.

    e. Do one of the following:

    - If you do not want to enable secure communication for PDC, deselect the **Enable SSL?** check box.
    - To enable secure communication for PDC, leave the **Enable SSL?** check box selected, and in the **KeyStore Location** field, enter the path of the client-side KeyStore file generated from the exported public certificate using the **keytool** utility.

      For more information, see "Configuring SSL for the WebLogic Server Domain".

38. Click **Next**.

    The Pricing Design Center WebLogic Server Connection window appears.

39. Enter the following details for the WebLogic Server domain in which you deployed PDC:

    a. In the **Host Name** field, enter the IP address or the host name of the machine on which the WebLogic Server domain is configured.

    b. In the **Port Number** field, enter the port number assigned to the WebLogic Server domain administration server.

    c. In the **User Name** field, enter the WebLogic Server domain administrator user name.

    d. In the **Password** field, enter the WebLogic Server domain administrator user password.

    e. Do one of the following:

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If you do not want to enable secure communication for PDC, deselect the **Enable SSL?** check box.

To enable secure communication for PDC, leave the **Enable SSL?** check box selected, and in the **KeyStore Location** field, enter the path of the client-side KeyStore file generated from the exported public certificate using the **keytool** utility.

For more information, see "Configuring SSL for the WebLogic Server Domain".

40. Click **Next**.

    The BRM Integration Pack Wallet Location and Password window appears.

41. Enter the following details for the BRM Integration Pack wallet:
    a. In the **Wallet Location** field, enter the path to the directory in which the BRM Integration Pack wallet is located or is to be installed.
    b. In the **Wallet Password** field, enter the BRM Integration Pack wallet password.
    c. In the **Confirm Wallet Password** field, enter the BRM Integration Pack wallet password again.
42. Click **Next**.

    The BRM Server Location window appears.

43. Enter the BRM batch and real-time rating engine details:
    a. In the **BRM** field, enter the full path or browse to the directory in which BRM is installed.
    b. In the **BRM Pipeline** field, enter the full path or browse to the directory in which Pipeline Manager is installed.
    c. In the **Perl Home** field, enter the full path or browse to the directory in which the Perl libraries for BRM are installed.
44. Click **Next**.

    The BRM Database Connection window appears.

45. Enter the following information required to connect to the BRM database:
    a. In the **Host Name** field, enter the IP address or the host name of the machine on which the BRM database is configured.
    b. In the **Port Number** field, enter the port number assigned to the BRM database service.

    > **Note**
    >
    > If the database is SSL-enabled, enter the SSL port number in the **Port Number** field.

    c. In the **User Name** field, enter the BRM database user name.

       This user should be the SYSDBA user or should have the following capabilities on the BRM database: grant create user, grant any role, grant any privileges, select any table to *username*, and grant sysdba to *username*.
    d. In the **Password** field, enter the BRM database user password.
    e. In the **Service Name** field, enter the name of the BRM database service.

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> **Note**
>
> Ensure that the Oracle Database server is in Running state. The Installer connects to the Oracle Database server to verify the information you entered is valid.

f. From the **SSL** list, select the type of SSL connection required for connecting to the BRM database:

- **No**: SSL authentication is not required.
- **Yes-One Way**: One-way SSL authentication is required. In this case, the client must authenticate the server's identity.
- **Yes-Two Way**: Two-way SSL authentication is required. In this case, both the client and server must authenticate each others identity.

g. If you selected **Yes-One Way** or **Yes-Two Way**, do the following:

- From the **Store Type** list, select the type of wallet to use for secure communication with the database: **SSO** or **PKCS12**.
- In the **Truststore Wallet Location** field, enter the full path to the directory in which the database wallet is located.
- In the **Truststore Wallet Password** field, enter the TrustStore wallet password to be used for secure communication.
- In the **Keystore Wallet Location** field, enter the full path or browse to the directory in which the database wallet is located.
- In the **Keystore Wallet Password** field, enter the KeyStore wallet password to be used for secure communication.

46. Click **Next**.

    The PDC Cross-Reference Schema User window appears.

47. Do one of the following:

- If you want to create a transformation cross-reference schema user during installation, select **Yes** and proceed to step 48.
- If you want to use an existing transformation cross-reference schema user, select **No** and proceed to step 52.

48. Click **Next**.

    The Transformation Cross-Reference Database Connection window appears.

49. Enter the following information required to connect to the transformation cross-reference database:

a. In the **Host Name** field, enter the IP address or the host name of the machine on which to create the transformation cross-reference schema.

b. In the **Port Number** field, enter the port number assigned to the transformation cross-reference database service.

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> **Note**
>
> If the database is SSL-enabled, enter the SSL port number in the **Port Number** field.

c. In the **User Name** field, enter the transformation cross-reference database user name.

   This user should be the SYSDBA user or should have the following capabilities on the transformation cross-reference database: grant create user, grant any role, grant any privileges, select any table to *username*, and grant sysdba to *username*.

d. In the **Password** field, enter the transformation cross-reference database user password.

e. In the **Service Name** field, enter the name of the transformation cross-reference database service.

> **Note**
>
> Ensure that the Oracle Database server is in Running state. The Installer connects to the Oracle Database server to verify the information you entered is valid.

f. From the **SSL** list, select the type of SSL connection required for connecting to the transformation cross-reference database:

   - **No**: SSL authentication is not required.
   - **Yes-One Way**: One-way SSL authentication is required. In this case, the client must authenticate the server's identity.
   - **Yes-Two Way**: Two-way SSL authentication is required. In this case, both the client and server must authenticate each others identity.

g. If you selected **Yes-One Way** or **Yes-Two Way**, do the following:

   - From the **Store Type** list, select the type of wallet to use for secure communication with the database: **SSO** or **PKCS12**.
   - In the **Truststore Wallet Location** field, enter the full path to the directory in which the database wallet is located.
   - In the **Truststore Wallet Password** field, enter the TrustStore wallet password to be used for secure communication.
   - In the **Keystore Wallet Location** field, enter the full path or browse to the directory in which the database wallet is located.
   - In the **Keystore Wallet Password** field, enter the KeyStore wallet password to be used for secure communication.

50. Click **Next**.

    The Transformation Cross-Reference Schema window appears.

51. Enter the following information required to create the transformation cross-reference schema in the transformation cross-reference database and proceed to step 54:

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> **Note**
>
> If you are migrating the pricing data from a source PDC system to a target PDC system that supports ECE, provide the details of the transformation cross-reference schema that you created for the source PDC system.

a. In the **User Name** field, enter a transformation cross-reference schema user name.
b. In the **Password** field, enter a transformation cross-reference schema user password.
c. In the **Confirm Password** field, enter the transformation cross-reference schema user password again.
d. In the **PDC Tablespace** field, enter the name of the tablespace for the transformation cross-reference schema.
e. In the **Temp Tablespace** field, enter the name of the temporary tablespace for the transformation cross-reference schema.

52. Click **Next**.

    The Transformation Cross-Reference Schema window appears.

53. Enter the following information required to connect to the transformation cross-reference database:

> **Note**
>
> If you are migrating the pricing data from a source PDC system to a target PDC system that supports ECE, provide the details of the transformation cross-reference schema that you created for the source PDC system.

a. In the **Host Name** field, enter the IP address or the host name of the machine on which the transformation cross-reference database is configured.
b. In the **Port Number** field, enter the port number assigned to the transformation cross-reference database service.

> **Note**
>
> If the database is SSL-enabled, enter the SSL port number in the **Port Number** field.

c. In the **Service Name** field, enter the name of the transformation cross-reference database service.
d. In the **User Name** field, enter the transformation cross-reference schema user name.
e. In the **Password** field, enter the transformation cross-reference schema user password.
f. Do one of the following:

   If you do not want to enable secure communication for the transformation cross-reference database, leave the **SSL Enabled** check box deselected. This is deselected by default.

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To enable secure communication for the transformation cross-reference database, select the **SSL Enabled** check box.

g. If you selected **SSL Enabled**, do the following:

In the **Wallet Location** field, enter the full path or browse to the directory in which the database wallet is located. For example, *wallet_home***/cwallet.sso** or *wallet_home***/ewallet.p12**.

From the **Wallet Type** list, select the wallet type.

In the **Wallet Password** field, enter the database wallet password if the wallet type is **PKCS12**.

54. Click **Next**.

The PDC User window appears.

55. Enter the PDC user information.

a. In the **User Name** field, enter the PDC user name.

b. In the **Password** field, enter the PDC user password.

56. Do one of the following:

- Click **Next**.

  The Migration Cross-Reference Database Connection window appears.

- If you selected **Do not install Migration utility** in step 13, proceed to step 66.

57. Enter the following information required to connect to the migration cross-reference database:

a. In the **Host Name** field, enter the IP address or the host name of the machine on which to create the migration cross-reference database.

b. In the **Port Number** field, enter the port number assigned to the migration cross-reference database service.

> **Note**
>
> If the database is SSL-enabled, enter the SSL port number in the **Port Number** field.

c. In the **User Name** field, enter the migration cross-reference database user name.

This user should be the SYSDBA user or should have the following capabilities on the migration cross-reference database: grant create user, grant any role, grant any privileges, select any table to *username*, and grant sysdba to *username*.

d. In the **Password** field, enter the migration cross-reference database user password.

e. In the **Service Name** field, enter the name of the migration cross-reference database service.

> **Note**
>
> Ensure that the Oracle Database server is in Running state. The Installer connects to the Oracle Database server to verify the information you entered is valid.

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f. From the **SSL** list, select the type of SSL connection required for connecting to the migration cross-reference database:
   - **No**: SSL authentication is not required.
   - **Yes-One Way**: One-way SSL authentication is required. In this case, the client must authenticate the server's identity.
   - **Yes-Two Way**: Two-way SSL authentication is required. In this case, both the client and server must authenticate each others identity.

g. If you selected **Yes-One Way** or **Yes-Two Way**, do the following:
   - From the **Wallet Type** list, select the type of wallet to use for secure communication with the database: **SSO** or **PKCS12**.
   - In the **Truststore Wallet Location** field, enter the full path to the directory in which the database wallet is located.
   - In the **Truststore Wallet Password** field, enter the TrustStore wallet password to be used for secure communication.
   - In the **Keystore Wallet Location** field, enter the full path or browse to the directory in which the database wallet is located.
   - In the **Keystore Wallet Password** field, enter the KeyStore wallet password to be used for secure communication.

58. Click **Next**.

    The Migration Cross-Reference Schema window appears.

59. Enter the following information required to create the migration cross-reference schema in the migration cross-reference database:
    a. In the **User Name** field, enter a migration cross-reference schema user name.
    b. In the **Password** field, enter a migration cross-reference schema user password.
    c. In the **PDC Tablespace** field, enter the name of the PDC tablespace for the migration cross-reference schema.
    d. In the **Temp Tablespace** field, enter the name of the temporary tablespace for the migration cross-reference schema.

60. Do one of the following:
    - Click **Next**.

      The Migration User window appears.
    - If you are migrating the PDC pricing data to a PDC system that supports ECE, proceed to step 62.

61. Enter the migration user details and proceed to step 66.
    a. In the **User Name** field, enter a migration user name.
    b. In the **Password** field, enter a migration user password.
    c. In the **Confirm Password** field, enter the migration user password again.

62. Click **Next**.

    The Source Migration User window appears.

63. If you are migrating the PDC pricing data to a PDC system that supports ECE, enter the migration user details that you use to run the migration utility in the source PDC system:
    a. In the **User Name** field, enter the migration user name.

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b. In the **Password** field, enter the migration user password.

c. In the **Confirm Password** field, enter the migration user password again.

64. Click **Next**.

    The Target Migration User window appears.

65. If you are migrating the PDC pricing data to a PDC system that supports ECE, enter the migration user details that you want to use to run the migration utility in the target PDC system:

    a. In the **User Name** field, enter the migration user name.

    b. In the **Password** field, enter the migration user password.

66. Click **Next**.

    The Installation Summary window appears.

67. Review the selections you have made in the preceding windows, and click **Install**.

    The Installation Progress window appears.

> **Note**
>
> After the installation begins, clicking **Stop installation** stops the installation process, but the files that are already copied are not removed.

68. When the installation is done, click **Next**. The Installation Complete window appears.

    Make a note of the provided URL, because you will need it to access PDC.

69. Click **Finish** to complete and exit.

70. If you selected **Apply WebLogic tuning parameters**, you must restart the WebLogic Server domain.

> **Note**
>
> Before starting PDC REST Services Manager for the first time, you must configure a unique AES master password and load it into the RSM process environment. See "Configuring the PDC REST Services Manager AES Master Password".

See "Verifying the Pricing Design Center Installation" for information on verifying the successful installation of PDC.

See "About Installation Logs" for information on PDC Installer logs.

Installing Only the PDC Software

To install only the PDC software:

1. Obtain the PDC software. See "Downloading the PDC Software".
2. Start the Oracle WebLogic Server domain administration server or the WebLogic Server domain managed server on which you want to deploy PDC, if it is not already started.
3. Ensure that the PDC database is running.

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> **Note**
>
> Ensure that the Oracle Database server is in Running state. The Installer connects to the Oracle Database server to verify the information you entered is valid.

4. Go to the *temp_dir* directory, and run one of the following commands:
   - To start the GUI installer:

     ```
     Java_home/bin/java -jar jarfile
     ```

     where:
     - *Java_home* is the directory in which you installed the latest supported Java version.
     - *jarfile* is the PDC installer file, for example **pdcserver-16.26.0.0.0.0_generic_full.jar**.
   - To start the GUI installer and install PDC using the **oraInventory** directory in a different location:

     ```
     Java_home/bin/java -jar jarfile -invPtrLoc Inventory_home/oraInst.loc
     ```

     where *Inventory_home* is the location of the Oracle inventory.
   - To start the GUI installer and create a silent installer response file during the installation:

     ```
     Java_home/bin/java -jar jarfile -record -destinationFile path
     ```

     where *path* is the response file location and name.

   The Welcome window appears.
5. Click **Next**.

   The Specify Inventory Directory and Credentials window appears if the **oraInst.loc** file is corrupt or not present. The default location of the **oraInventory** directory is in the **/etc/oraInst.loc** file.

   This window displays the path to the default inventory directory and the default operating system group name.
6. (Optional) To change the default inventory directory details, do the following:
   a. Enter the full path of the inventory directory.
   b. Specify the name of the operating system group that has write permission to the inventory directory.
7. Click **Next**.

   The Installation Location window appears.
8. Enter the full path or browse to the directory in which to install PDC.
9. Click **Next**.

   The Installation Type window appears.
10. Select **Pricing Design Center** and click **Next**.

    The PDC WebLogic Server window appears.
11. Enter the following details for the WebLogic Server domain in which you want to deploy PDC:

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a. In the **Host Name** field, enter the IP address or the host name of the machine on which the WebLogic Server domain is configured.

b. In the **Port Number** field, enter the port number assigned to the WebLogic Server domain administration server.

c. In the **User Name** field, enter the WebLogic Server domain administrator user name.

d. In the **Password** field, enter the WebLogic Server domain administrator user password.

e. In the **WebLogic Home** field, enter the path to the directory in which the WebLogic Server software is installed. For example, *Middleware_home***/wlserver**.

f. To enable secure communication for PDC, select the **Enable SSL? (Recommended)** check box, and in the **KeyStore Location** field, enter the path of the client-side KeyStore file generated from the exported public certificate using the **keytool** utility.

For more information, see "Configuring SSL for the WebLogic Server Domain".

g. To allow the import and export of large XML files into PDC, select **Apply WebLogic tuning parameters**. For information about the WebLogic tuning parameters, see the installer Help.

> **Note**
>
> If you select this check box, you must restart the WebLogic Server domain after PDC installs successfully.

12. Click **Next**.

The PDC Wallet Location and Password window appears.

13. Enter the following details for the PDC wallet:

a. In the **Wallet Location** field, enter the path to the directory in which the PDC wallet is located or is to be installed.

b. In the **Wallet Password** field, enter the PDC wallet password.

c. In the **Confirm Wallet Password** field, enter the PDC wallet password again.

14. Click **Next**.

The WebLogic Server window appears.

15. Do one of the following:

- To deploy PDC on a WebLogic Server domain administration server, select a WebLogic Server domain administration server from the list.
- To deploy PDC on a WebLogic Server domain managed server, select a WebLogic Server domain managed server from the list.

> **Note**
>
> Oracle recommends that you deploy PDC on a WebLogic Server managed server. If you select a WebLogic Server managed server, ensure that the WebLogic Server managed server and the node manager are running.

16. Click **Next**.

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The Pricing Design Center Schema User window appears.

17. Do one of the following:
    - If you want to create a PDC schema user during installation, select **Yes** and proceed to step 18.
    - If you want to use an existing PDC schema user, select **No** and proceed to step 22.
18. Click **Next**.

    The Pricing Design Center System Database Connection window appears.
19. Enter the following information required to connect to the PDC database:
    a. In the **Host Name** field, enter the IP address or the host name of the machine on which to create the PDC database schema.
    b. In the **Port Number** field, enter the port number assigned to the PDC database service.

    > **Note**
    >
    > If the database is SSL-enabled, enter the SSL port number in the **Port Number** field.

    c. In the **User Name** field, enter the PDC database user name.

    This user must be a **database administrator (SYSDBA)** on the PDC database. Alternatively, the user must have sufficient administrative privileges, including CREATE USER, GRANT ANY ROLE, GRANT ANY PRIVILEGE, and SELECT ANY TABLE.

    d. In the **Password** field, enter the PDC database user password.
    e. In the **Service Name** field, enter the name of the PDC database service.

    > **Note**
    >
    > Ensure that the Oracle Database server is in Running state. The Installer connects to the Oracle Database server to verify the information you entered is valid.

    f. From the **SSL** list, select the type of SSL connection required for connecting to the PDC database:
    - **No**: SSL authentication is not required.
    - **Yes-One Way**: One-way SSL authentication is required. In this case, the client must authenticate the server's identity.
    - **Yes-Two Way**: Two-way SSL authentication is required. In this case, both the client and server must authenticate each others identity.

    g. If you selected **Yes-One Way** or **Yes-Two Way**, do the following:
    - From the **Wallet Type** list, select the type of wallet to use for secure communication with the database: **SSO** or **PKCS12**.
    - In the **Truststore Wallet Location** field, enter the full path to the directory in which the database wallet is located.

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- In the **Truststore Wallet Password** field, enter the TrustStore wallet password to be used for secure communication.
- In the **Keystore Wallet Location** field, enter the full path or browse to the directory in which the database wallet is located.
- In the **Keystore Wallet Password** field, enter the KeyStore wallet password to be used for secure communication.

20. Click **Next**.

    The Pricing Design Center Schema window appears.

21. Enter the following information required to create the PDC schema in the PDC database and proceed to step 24:

    a. In the **User Name** field, enter a PDC schema user name.

    b. In the **Password** field, enter a PDC schema user password.

    c. In the **Confirm Password** field, enter the PDC schema user password again.

    d. In the **PDC Tablespace** field, enter the name of the tablespace for the PDC schema.

    e. In the **Temp Tablespace** field, enter the name of the temporary tablespace for the PDC schema.

    > **Note**
    >
    > If you point to a PDC tablespace with an existing schema, the installer validates the PDC schema. If the validation succeeds, PDC re-uses the existing PDC schema. If you point to an empty PDC tablespace, the installer creates a new PDC schema.

22. Click **Next**.

    The Pricing Design Center Schema window appears.

23. Enter the following information required to connect to an existing PDC schema:

    a. In the **Host Name** field, enter the IP address or the host name of the machine with the PDC database schema.

    b. In the **Port Number** field, enter the port number assigned to the PDC database service.

    > **Note**
    >
    > If the database is SSL-enabled, enter the SSL port number in the **Port Number** field.

    c. In the **User Name** field, enter the PDC database user name.

    This user should be the SYSDBA user or should have the following capabilities on the PDC database: grant create user, grant any role, grant any privileges, select any table to *username*, and grant sysdba to *username*.

    d. In the **Password** field, enter the PDC database user password.

    e. In the **Service Name** field, enter the name of the PDC database service.

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> **Note**
>
> Ensure that the Oracle Database server is in Running state. The Installer connects to the Oracle Database server to verify the information you entered is valid.

f. From the **SSL** list, select the type of SSL connection required for connecting to the PDC database:

- **No**: SSL authentication is not required.
- **Yes-One Way**: One-way SSL authentication is required. In this case, the client must authenticate the server's identity.
- **Yes-Two Way**: Two-way SSL authentication is required. In this case, both the client and server must authenticate each others identity.

g. If you selected **Yes-One Way** or **Yes-Two Way**, do the following:

- From the **Wallet Type** list, select the type of wallet to use for secure communication with the database: **SSO** or **PKCS12**.
- In the **Truststore Wallet Location** field, enter the full path to the directory in which the database wallet is located.
- In the **Truststore Wallet Password** field, enter the TrustStore wallet password to be used for secure communication.
- In the **Keystore Wallet Location** field, enter the full path or browse to the directory in which the database wallet is located.
- In the **Keystore Wallet Password** field, enter the KeyStore wallet password to be used for secure communication.

24. Click **Next**.

The Pricing Design Center System Database Connection window appears.

25. Enter the following information required to connect to the PDC database:

a. In the **Host Name** field, enter the IP address or the host name of the machine on which to create the PDC database schema.

b. In the **Port Number** field, enter the port number assigned to the PDC database service.

> **Note**
>
> If the database is SSL-enabled, enter the SSL port number in the **Port Number** field.

c. In the **User Name** field, enter the PDC database user name.

This user should be the SYSDBA user or should have the following capabilities on the PDC database: grant create user, grant any role, grant any privileges, select any table to *username*, and grant sysdba to *username*.

d. In the **Password** field, enter the PDC database user password.

e. In the **Service Name** field, enter the name of the PDC database service.

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> **Note**
>
> Ensure that the Oracle Database server is in Running state. The Installer connects to the Oracle Database server to verify the information you entered is valid.

f. From the **SSL** list, select the type of SSL connection required for connecting to the PDC database:

- **No**: SSL authentication is not required.
- **Yes-One Way**: One-way SSL authentication is required. In this case, the client must authenticate the server's identity.
- **Yes-Two Way**: Two-way SSL authentication is required. In this case, both the client and server must authenticate each others identity.

g. If you selected **Yes-One Way** or **Yes-Two Way**, do the following:

- From the **Wallet Type** list, select the type of wallet to use for secure communication with the database: **SSO** or **PKCS12**.
- In the **Truststore Wallet Location** field, enter the full path to the directory in which the database wallet is located.
- In the **Truststore Wallet Password** field, enter the TrustStore wallet password to be used for secure communication.
- In the **Keystore Wallet Location** field, enter the full path or browse to the directory in which the database wallet is located.
- In the **Keystore Wallet Password** field, enter the KeyStore wallet password to be used for secure communication.

26. Click **Next**.

    The Pricing Design Center Schema window appears.

27. Enter the following information required to create the PDC schema in the PDC database:

    a. In the **User Name** field, enter a PDC schema user name.

    b. In the **Password** field, enter a PDC schema user password.

    c. In the **PDC Tablespace** field, enter the name of the tablespace for the PDC schema.

    d. In the **Temp Tablespace** field, enter the name of the temporary tablespace for the PDC schema.

28. Click **Next**.

    The Pricing Design Center System User window appears.

29. Enter the following information to create a PDC user to access the PDC GUI:

    a. In the **User Name** field, enter a PDC user name.

    b. In the **Password** field, enter a PDC user password.

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> **Note**
>
> - The PDC user password can be a maximum of 12 characters long and should contain at least one non-alphabetic character.
> - The user name must not be a part of the password.

c. In the **Confirm Password** field, enter the PDC user password again.

30. Click **Next**.

    The Select Charging Engine for Usage Rating appears.

31. Do one of the following:

    - To use Oracle Communications Billing and Revenue Management (BRM) Elastic Charging Engine (ECE) for usage rating, select **Elastic Charging Engine**.
    - To use BRM real-time rating and batch rating engines for usage rating, select **Realtime Rating and Batch Rating Engines**.

> **Note**
>
> If you choose to reuse an existing PDC schema, you must also choose the same rating engine as the existing PDC installation. That is, if your existing PDC installation uses Elastic Charging Engine (ECE) for usage rating, you cannot switch to the Realtime Rating and Batch Rating Engines. Likewise, if your existing PDC installation uses the Realtime Rating and Batch Rating Engines for usage rating, you cannot switch to ECE. If you attempt to switch rating engines, the PDC installer generates an error and prevents you from proceeding with the installation process.

32. Click **Next**.

    The Installation Summary window appears.

33. Review the selections you have made in the preceding windows, and click **Install**.

    The Installation Progress window appears.

> **Note**
>
> After the installation begins, clicking **Stop installation** stops the installation process, but the files that are already copied are not removed.

34. When the installation is done, click **Next**. The Installation Complete window appears.

    Note down the provided URL, because you will need it to access PDC.

35. Click **Finish** to complete and exit.

36. If you selected **Apply WebLogic tuning parameters**, you must restart the WebLogic Server domain.

See "Verifying the Pricing Design Center Installation" for information on verifying the successful installation of PDC.

See "About Installation Logs" for information on PDC Installer logs.

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Installing Only BRM Integration Pack

BRM Integration Pack is a set of utilities that transform and transfer pricing components configured in PDC to the BRM system. If BRM and Pipeline Manager are installed on different machines, you must also install Pipeline Configuration Manager. For instructions on how to install Pipeline Configuration Manager, see *BRM Installation Guide*.

> **Note**
>
> BRM Integration Pack installation must be performed as the Linux user who installed BRM; for example, **pin_user**.

To install only BRM Integration Pack:

1. Obtain the PDC software. See "Downloading the PDC Software".
2. Start the Oracle WebLogic Server domain administration server or the managed server on which you want to deploy PDC, if it is not already started.
3. Verify that you can connect to the BRM database.
4. Go to the *temp_dir* directory, and run one of the following commands:
   - To start the GUI installer:

     ```
     Java_home/bin/java -jar jarfile
     ```

     where:
     - *Java_home* is the directory in which you installed the latest supported Java version.
     - *jarfile* is the PDC installer file, for example **pdcserver-16.26.0.0.0.0_generic_full.jar**.
   - To start the GUI installer and install PDC using the **oraInventory** directory in a different location:

     ```
     Java_home/bin/java -jar jarfile -invPtrLoc Inventory_home/oraInst.loc
     ```

     where *Inventory_home* is the location of the Oracle inventory.
   - To start the GUI installer and create a silent installer response file during the installation:

     ```
     Java_home/bin/java -jar jarfile -record -destinationFile path
     ```

     where *path* is the response file location and name.

   The Welcome window appears.
5. Click **Next**.

   The Specify Inventory Directory and Credentials window appears if the **oraInst.loc** file is corrupt or not present. The default location of the **oraInventory** directory is in the **/etc/oraInst.loc** file.

   This window displays the path to the default inventory directory and the default operating system group name.
6. (Optional) To change the default inventory directory details, do the following:

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a. Enter the full path of the inventory directory.

b. Specify the name of the operating system group that has write permission to the inventory directory.

7. Click **Next**.

   The Installation Location window appears.

8. Enter the full path or browse to the directory in which to install BRM Integration Pack.

> **Note**
>
> If you are installing BRM Integration Pack on the machine on which PDC is installed, then you must provide a different name and path for the BRM Integration Pack installation.

9. Click **Next**.

   The Installation Type window appears.

10. Select **BRM Integration Pack** and click **Next**.

    The BRM Integration Pack Pre-requisite Libraries Location window appears.

11. In the **Prerequisite library location** field, enter the full path or browse to the directory in which you copied all of the PDC JAR files. See "Copying Library JAR Files for PDC Installation" for more information.

12. Click **Next**.

    The Migration Option window appears.

13. Do one of the following:

    - If you do not want to migrate data, select **Do not install Migration Utility** and proceed to step 18.
    - To migrate the BRM real-time and batch rating engines pricing data to a PDC system that supports BRM real-time and batch rating engines, select **Migrate RRE and BRE Pricing Data to PDC** and proceed to step 18.
    - To migrate the BRM real-time and batch rating engines pricing data to a PDC system that supports ECE, select **Migrate RRE and BRE Pricing Data to PDC with ECE** and proceed to step 18.
    - To migrate the PDC pricing data to a PDC system that supports ECE, select **Migrate PDC Pricing Data to PDC with ECE** and proceed to step 14.

14. Click **Next**.

    The Source WebLogic Administration Server Connection window appears.

15. If you are migrating the PDC pricing data to a PDC system that supports ECE, enter the following details for the WebLogic Server domain in which you deployed the source PDC system:

    a. In the **Host Name** field, enter the IP address or the host name of the machine on which the WebLogic Server domain for the source PDC system is configured.

    b. In the **Port Number** field, enter the port number assigned to the WebLogic Server domain administration server.

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> **Note**
>
> If you selected a WebLogic Server domain managed server during the PDC installation, enter the port number to the managed server.

c. In the **User Name** field, enter the WebLogic Server domain administrator user name.

d. In the **Password** field, enter the WebLogic Server domain administrator user password.

e. In the **WebLogic Home** field, enter the path of the directory where the Oracle WebLogic Server software is installed.

f. Do one of the following:

- If you do not want to enable secure communication for PDC, deselect the **Enable SSL?** check box.
- To enable secure communication for PDC, leave **Enable SSL?** check box selected, and in the **KeyStore Location** field, enter the path of the client-side KeyStore file generated from the exported public certificate using the **keytool** utility.

  For more information, see "Configuring SSL for the WebLogic Server Domain".

16. Click **Next**.

    The Target Pricing Design Center WebLogic Server Connection window appears.

17. If you are migrating the PDC pricing data to a PDC system that supports ECE, enter the following details for the WebLogic Server domain in which you deployed the target PDC system:

    a. In the **Host Name** field, enter the IP address or the host name of the machine on which the WebLogic Server domain for the target PDC system is configured.

    b. In the **Port Number** field, enter the port number assigned to the WebLogic Server domain administration server.

    c. In the **User Name** field, enter the WebLogic Server domain administrator user name.

    d. In the **Password** field, enter the WebLogic Server domain administrator user password.

    e. Do one of the following:

    - If you do not want to enable secure communication for PDC, deselect the **Use SSL?** check box.
    - To enable secure communication for PDC, leave the **Use SSL?** check box selected, and in the **KeyStore Location** field, enter the path of the client-side KeyStore file generated from the exported public certificate using the **keytool** utility.

      For more information, see "Configuring SSL for the WebLogic Server Domain".

18. Click **Next**.

    The Pricing Design Center WebLogic Server Connection window appears.

19. Enter the following details for the WebLogic Server domain in which you deployed PDC:

    a. In the **Host Name** field, enter the IP address or the host name of the machine on which the WebLogic Server domain is configured.

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b. In the **Port Number** field, enter the port number assigned to the WebLogic Server domain administration server.

c. In the **User Name** field, enter the WebLogic Server domain administrator user name.

d. In the **Password** field, enter the WebLogic Server domain administrator user password.

e. Do one of the following:

- If you do not want to enable secure communication for PDC, deselect the **Use SSL?** check box.
- To enable secure communication for PDC, leave the **Use SSL?** check box selected, and in the **KeyStore Location** field, enter the path of the client-side KeyStore file generated from the exported public certificate using the **keytool** utility.

  For more information, see "Configuring SSL for the WebLogic Server Domain".

20. Click **Next**.

    The BRM Integration Pack Wallet Location and Password window appears.

21. Enter the following details for the BRM Integration Pack wallet:

    a. In the **Wallet Location** field, enter the path to the directory in which the BRM Integration Pack wallet is located or is to be installed.

    b. In the **Wallet Password** field, enter the BRM Integration Pack wallet password.

    c. In the **Confirm Wallet Password** field, enter the BRM Integration Pack wallet password again.

22. Click **Next**.

    The BRM Server Location window appears.

23. Enter the BRM batch and real-time rating engine details:

    a. In the **BRM** field, enter the path to the directory in which BRM is installed.

    b. In the **BRM Pipeline** field, enter the path to the directory in which Pipeline Manager is installed.

    c. In the **Perl Home** field, enter the path to the directory in which the Perl libraries are installed.

24. Click **Next**.

    The BRM Pipeline Database Connection window appears.

25. Enter the following information required to connect to the BRM database:

    a. In the **Host Name** field, enter the IP address or the host name of the machine on which the BRM database is configured.

    b. In the **Port Number** field, enter the port number assigned to the BRM database service.

> **Note**
>
> If the database is SSL-enabled, enter the SSL port number in the **Port Number** field.

    c. In the **User Name** field, enter the BRM database user name.

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This user should be the SYSDBA user or should have the following capabilities on the BRM database: grant create user, grant any role, grant any privileges, select any table to *username*, and grant sysdba to *username*.

d. In the **Password** field, enter the BRM database user password.

e. In the **Service Name** field, enter the name of the BRM database service.

> **Note**
>
> Ensure that the Oracle Database server is in Running state. The Installer connects to the Oracle Database server to verify the information you entered is valid.

f. From the **SSL** list, select the type of SSL connection required for connecting to the BRM database:

- **No**: SSL authentication is not required.
- **Yes-One Way**: One-way SSL authentication is required. In this case, the client must authenticate the server's identity.
- **Yes-Two Way**: Two-way SSL authentication is required. In this case, both the client and server must authenticate each others identity.

g. If you selected **Yes-One Way** or **Yes-Two Way**, do the following:

- From the **Wallet Type** list, select the type of wallet to use for secure communication with the database: **SSO** or **PKCS12**.
- In the **Truststore Wallet Location** field, enter the full path to the directory in which the database wallet is located.
- In the **Truststore Wallet Password** field, enter the TrustStore wallet password to be used for secure communication.
- In the **Keystore Wallet Location** field, enter the full path or browse to the directory in which the database wallet is located.
- In the **Keystore Wallet Password** field, enter the KeyStore wallet password to be used for secure communication.

26. Click **Next**.

    The PDC Cross-Reference Schema User window appears.

27. Do one of the following:

- If you want to create a transformation cross-reference schema user during installation, select **Yes** and proceed to step 28.
- If you want to use an existing transformation cross-reference schema user, select **No** and proceed to step 32.

28. Click **Next**.

    The PDC Cross-Reference Database Connection window appears.

29. Enter the following information required to connect to the PDC cross-reference database:

a. In the **Host Name** field, enter the IP address or the host name of the machine on which to create the PDC cross-reference schema.

b. In the **Port Number** field, enter the port number assigned to the PDC cross-reference database service.

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> **Note**
>
> If the database is SSL-enabled, enter the SSL port number in the **Port Number** field.

c. In the **User Name** field, enter the PDC cross-reference database user name.

   This user should be the SYSDBA user or should have the following capabilities on the PDC cross-reference database: grant create user, grant any role, grant any privileges, select any table to *username*, and grant sysdba to *username*.

d. In the **Password** field, enter the PDC cross-reference database user password.

e. In the **Service Name** field, enter the name of the PDC cross-reference database service.

> **Note**
>
> Ensure that the Oracle Database server is in Running state. The Installer connects to the Oracle Database server to verify the information you entered is valid.

f. From the **SSL** list, select the type of SSL connection required for connecting to the PDC cross-reference database:

   - **No**: SSL authentication is not required.
   - **Yes-One Way**: One-way SSL authentication is required. In this case, the client must authenticate the server's identity.
   - **Yes-Two Way**: Two-way SSL authentication is required. In this case, both the client and server must authenticate each others identity.

g. If you selected **Yes-One Way** or **Yes-Two Way**, do the following:

   - From the **Wallet Type** list, select the type of wallet to use for secure communication with the database: **SSO** or **PKCS12**.
   - In the **Truststore Wallet Location** field, enter the full path to the directory in which the database wallet is located.
   - In the **Truststore Wallet Password** field, enter the TrustStore wallet password to be used for secure communication.
   - In the **Keystore Wallet Location** field, enter the full path or browse to the directory in which the database wallet is located.
   - In the **Keystore Wallet Password** field, enter the KeyStore wallet password to be used for secure communication.

30. Click **Next**.

    The PDC Cross-Reference Schema window appears.

31. Enter the following information required to create the PDC cross-reference schema and proceed to step 34:

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> **Note**
>
> If you are migrating the pricing data from a source PDC system to a target PDC system that supports ECE, provide the details of the PDC cross-reference schema that you created for the source PDC system.

a. In the **User Name** field, enter a PDC cross-reference schema user name.
b. In the **Password** field, enter a PDC cross-reference schema user password.
c. In the **Confirm Password** field, enter the PDC cross-reference schema user password again.
d. In the **PDC Tablespace** field, enter the name of the tablespace for the PDC cross-reference schema.
e. In the **Temp Tablespace** field, enter the name of the temporary tablespace for the PDC cross-reference schema.

32. Click **Next**.

    The PDC Cross-Reference Schema window appears.

33. Enter the following information required to connect to the PDC cross-reference database:

> **Note**
>
> If you are migrating the pricing data from a source PDC system to a target PDC system that supports ECE, provide the details of the PDC cross-reference schema that you created for the source PDC system.

a. In the **Host Name** field, enter the IP address or the host name of the machine on which to create the PDC cross-reference schema.
b. In the **Port Number** field, enter the port number assigned to the PDC cross-reference database service.

> **Note**
>
> If the database is SSL-enabled, enter the SSL port number in the **Port Number** field.

c. In the **User Name** field, enter the PDC cross-reference database user name.

   This user should be the SYSDBA user or should have the following capabilities on the PDC cross-reference database: grant create user, grant any role, grant any privileges, select any table to *username*, and grant sysdba to *username*.

d. In the **Password** field, enter the PDC cross-reference database user password.
e. In the **Service Name** field, enter the name of the PDC cross-reference database service.

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> **Note**
>
> Ensure that the Oracle Database server is in Running state. The Installer connects to the Oracle Database server to verify the information you entered is valid.

f. From the **SSL** list, select the type of SSL connection required for connecting to the PDC cross-reference database:
   - **No**: SSL authentication is not required.
   - **Yes-One Way**: One-way SSL authentication is required. In this case, the client must authenticate the server's identity.
   - **Yes-Two Way**: Two-way SSL authentication is required. In this case, both the client and server must authenticate each others identity.

g. If you selected **Yes-One Way** or **Yes-Two Way**, do the following:
   - From the **Wallet Type** list, select the type of wallet to use for secure communication with the database: **SSO** or **PKCS12**.
   - In the **Truststore Wallet Location** field, enter the full path to the directory in which the database wallet is located.
   - In the **Truststore Wallet Password** field, enter the TrustStore wallet password to be used for secure communication.
   - In the **Keystore Wallet Location** field, enter the full path or browse to the directory in which the database wallet is located.
   - In the **Keystore Wallet Password** field, enter the KeyStore wallet password to be used for secure communication.

34. Click **Next**.

    The Pricing Design Center System User window appears.

35. Enter the PDC user information.
    a. In the **User Name** field, enter the PDC user name.
    b. In the **Password** field, enter the PDC user password.

36. Do one of the following:
    - Click **Next**.

      The Migration Cross-Reference Database Connection window appears.
    - If you selected **Do not install Migration Utility** in step 13, proceed to step 46.

37. Enter the following information required to connect to the migration cross-reference database:
    a. In the **Host Name** field, enter the IP address or the host name of the machine on which to create the migration cross-reference database.
    b. In the **Port Number** field, enter the port number assigned to the migration cross-reference database service.

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> **Note**
>
> If the database is SSL-enabled, enter the SSL port number in the **Port Number** field.

c. In the **User Name** field, enter the migration cross-reference database user name.

   This user should be the SYSDBA user or should have the following capabilities on the migration cross-reference database: grant create user, grant any role, grant any privileges, select any table to *username*, and grant sysdba to *username*.

d. In the **Password** field, enter the migration cross-reference database user password.

e. In the **Service Name** field, enter the name of the migration cross-reference database service.

> **Note**
>
> Ensure that the Oracle Database server is in Running state. The Installer connects to the Oracle Database server to verify the information you entered is valid.

f. From the **SSL** list, select the type of SSL connection required for connecting to the migration cross-reference database:

   - **No**: SSL authentication is not required.
   - **Yes-One Way**: One-way SSL authentication is required. In this case, the client must authenticate the server's identity.
   - **Yes-Two Way**: Two-way SSL authentication is required. In this case, both the client and server must authenticate each others identity.

g. If you selected **Yes-One Way** or **Yes-Two Way**, do the following:

   - From the **Wallet Type** list, select the type of wallet to use for secure communication with the database: **SSO** or **PKCS12**.
   - In the **Truststore Wallet Location** field, enter the full path to the directory in which the database wallet is located.
   - In the **Truststore Wallet Password** field, enter the TrustStore wallet password to be used for secure communication.
   - In the **Keystore Wallet Location** field, enter the full path or browse to the directory in which the database wallet is located.
   - In the **Keystore Wallet Password** field, enter the KeyStore wallet password to be used for secure communication.

38. Click **Next**.

    The Migration Cross-Reference Schema window appears.

39. Enter the following information required to create the migration cross-reference schema in the migration cross-reference database:

    a. In the **User Name** field, enter a migration cross-reference schema user name.

    b. In the **Password** field, enter a migration cross-reference schema user password.

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c. In the **PDC Tablespace** field, enter the name of the PDC tablespace for the migration cross-reference schema.

d. In the **Temp Tablespace** field, enter the name of the temporary tablespace for the migration cross-reference schema.

40. Do one of the following:

- Click **Next**.

  The Migration User window appears.

- If you are migrating the PDC pricing data to a PDC system that supports ECE, proceed to step 42.

41. Enter the migration user details and proceed to step 46.

a. In the **User Name** field, enter a migration user name.

b. In the **Password** field, enter a migration user password.

42. Click **Next**.

The Source Migration User window appears.

43. If you are migrating the PDC pricing data to a PDC system that supports ECE, enter the migration user details that you use to run the migration utility in the source PDC system:

a. In the **User Name** field, enter the migration user name.

b. In the **Password** field, enter the migration user password.

c. In the **Confirm Password** field, enter the migration user password again.

44. Click **Next**.

The Target Migration User window appears.

45. If you are migrating the PDC pricing data to a PDC system that supports ECE, enter the migration user details that you want to use to run the migration utility in the target PDC system:

a. In the **User Name** field, enter the migration user name.

b. In the **Password** field, enter the migration user password.

c. In the **Confirm Password** field, enter the migration user password again.

46. Click **Next**.

The Installation Summary window appears.

47. Review the selections you have made in the preceding windows, and click **Install**.

The Installation Progress window appears.

> **Note**
>
> After the installation begins, clicking **Stop installation** stops the installation process, but the files that are already copied are not removed.

48. When the installation is done, click **Next**. The Installation Complete window appears.

49. Click **Finish** to complete and exit.

See "Verifying the Pricing Design Center Installation" for information on verifying the successful installation of BRM Integration Pack.

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See "About Installation Logs" for information on PDC Installer logs.

Installing Only PDC REST Services Manager

To install only PDC REST Services Manager:

1. Obtain the PDC software. See "Downloading the PDC Software".
2. Start the Oracle WebLogic Server domain administration server or the managed server on which you want to deploy PDC REST Services Manager, if it is not already started.
3. Ensure that the PDC database is running.
4. Go to the *temp_dir* directory, and run one of the following commands:
   - To start the GUI installer:

     ```
     Java_home/bin/java -jar jarfile
     ```

     where:
     - *Java_home* is the directory in which you installed the latest supported Java version.
     - *jarfile* is the PDC installer file, for example **pdcserver-16.26.0.0.0.0_generic_full.jar**.
   - To start the GUI installer and install PDC using the **oraInventory** directory in a different location:

     ```
     Java_home/bin/java -jar jarfile -invPtrLoc Inventory_home/oraInst.loc
     ```

     where *Inventory_home* is the location of the Oracle inventory.
   - To start the GUI installer and create a silent installer response file during the installation:

     ```
     Java_home/bin/java -jar jarfile -record -destinationFile path
     ```

     where *path* is the response file location and name.

   The Welcome window appears.
5. Click **Next**.

   The Specify Inventory Directory and Credentials window appears if the **oraInst.loc** file is corrupt or not present. The default location of the **oraInventory** directory is in the **/etc/oraInst.loc** file.

   This window displays the path to the default inventory directory and the default operating system group name.
6. (Optional) To change the default inventory directory details, do the following:
   a. Enter the full path of the inventory directory.
   b. Specify the name of the operating system group that has write permission to the inventory directory.
7. Click **Next**.

   The Installation Location window appears.
8. Enter the full path or browse to the directory in which to install PDC REST Services Manager.
9. Click **Next**.

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The Installation Type window appears.

10. Select **PDC REST Services Manager** and click **Next**.

    The PDC REST Services Manager window appears.

11. In the **Listener Port** field, enter the port number assigned to listen for API requests from the enterprise product catalog.

12. Click **Next**.

    The PDC Instance Details window appears.

13. Enter the following information required to communicate with the PDC:

    a. In the **Host Name** field, enter the IP address or host name of the machine on which PDC is installed.

    b. In the **Port Number** field, enter the port number of the PDC T3 service receiving product offer configurations from the PDC REST Services Manager.

    c. In the **User Name** field, enter the PDC user name.

    d. In the **Password** field, enter the password for the PDC user.

    e. In the **Admin User Name** field, enter the PDC admin user name, which includes the Pricing Design Admin role.

    f. In the **Admin Password** field, enter the password for the Admin user.

    g. Do one of the following:

    - If you want to enable secure communication for the PDC database, leave the **Enable SSL** check box selected. This is selected by default.
    - To disable secure communication for the PDC database, deselect the **Enable SSL** check box.

14. Click **Next**.

    The Installation Summary window appears.

15. Review the selections you have made in the preceding windows, and click **Install**.

    The Installation Progress window appears.

16. When the installation is done, click **Next**.

    The Installation Complete window appears.

17. Click **Finish** to complete and exit.

You can check the log files in the *PDC_RSM_home***/apps/log** directory, where *PDC_RSM_home* is the directory in which you installed PDC REST Services Manager.

> **Note**
>
> If you installed PDC REST Services Manager as part of the Complete installation, you must configure a unique AES master password and load it into the RSM process environment. See "Configuring the PDC REST Services Manager AES Master Password".

You can use the *PDC_RSM_home***/apps/bin/RestServicesManager.sh** control script to start, stop, restart, or check the status of PDC REST Services Manager. You can use the following arguments with the script:

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- **start**: To start the REST Services Manager
- **stop**: To stop the REST Services Manager
- **restart**: To restart the REST Services Manager
- **hash** [*value*]: To encrypt passwords or sensitive information

Installing PDC in Silent Mode

Use silent install mode when you are installing PDC using the same configuration repeatedly. Silent install mode does not use the GUI and it runs in the background.

In this mode, you use a response file template that contains a predefined set of values to install PDC, BRM Integration Pack, and PDC REST Services Manager. You can generate a response file that contains the parameters and values during the PDC GUI installation.

Creating a Response File

To create a response file:

1. Create the response file by doing one of the following:
   - Create a copy of the response file that was generated during the GUI upgrade. See "Upgrading Both PDC and BRM Integration Pack" for more information.

     > **Note**
     >
     > The GUI Installer does not store passwords provided during installation in the response file. You must manually add the passwords after creating a copy of the response file.

   - Create a response file using the template by running the following command:

     ```
     Java_home/bin/java -jar pdcserver-16.26.0.0.0_generic_full.jar -getResponseFileTemplates
     ```

     where *Java_home* is the directory in which you installed the latest supported Java version.

     The following response file is created with the default value: **oracle.communications.pdc.PricingDesignCenter.rsp**. Use this file template if you are installing PDC and BRM Integration Pack.

   You can create as many response files as needed.
2. Open the file in a text editor.
3. Modify the response file you copied by specifying the key-value information for the parameters you want in your installation.

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> **Note**
>
> - The response file template contains guidelines and examples on how to enter the values in the parameters.
> - The Installer treats incorrect context, format, and type values in a response file as if no value were specified.

4. Save and close the response file.

Installing PDC in Silent Mode

To install the PDC software, BRM Integration Pack, and PDC REST Services Manager in silent mode:

1. Create the response file. See "Creating a Response File".
2. Copy the response file you created to the machine on which you run the silent installation.
3. On the machine on which you run the silent installation, go to the *temp_dir* directory to which you have downloaded the BRM Integration Pack, and run the following command:

   ```
   Java_home/bin/java -jar jarfile -debug -invPtrLoc Inventory_home/oraInventory/
   oraInst.loc [parameter=value] -responseFile path -silent
   ```

   where:

   - *Java_home* is the directory in which you installed the latest supported Java version.
   - *jarfile* is the PDC installer file, for example **pdcserver-16.26.0.0.0_generic_full.jar**.
   - *Inventory_home* is the location of the Oracle inventory.
   - *parameter* is the name of an installation parameter.
   - *value* is the value of the installation parameter.
   - *path* is the absolute path to the response file.

   For example:

   ```
   Java_home/bin/java -jar pdcserver-16.26.0.0.0_generic_full.jar -debug -invPtrLoc
   Inventory_home/oraInventory/oraInst.loc INSTALL_TYPE=Complete -responseFile /tmp/
   oracle.communications.pdc.PricingDesignCenter.rsp -silent
   ```

   The installation runs silently in the background.

See "Verifying the Pricing Design Center Installation" for information on verifying the successful installation of PDC and BRM Integration Pack.

See "About Installation Logs" for information on the PDC Installer logs.

About Installation Logs

The installation logs are used for debugging purposes. You can check the log files in the **oraInventory/logs** directory. The default location of the **oraInventory** directory is in the **/etc/oraInst.loc** file.

You use the following log files to monitor installation and postinstallation processes:

- **installAction***TimeStamp***.log**

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- **oraInstall***TimeStamp***.err**
- **oraInstall***TimeStamp***.out**
- **dbScriptsg***TimeStamp***.log** (for the scripts run using SQL*Plus and JDBC)
- **silentInstall***TimeStamp***.log** (for silent mode installation)

  where *TimeStamp* is the date and time the log file was created.

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5

Pricing Design Center Postinstallation Tasks

Learn how to perform postinstallation tasks, such as creating users or synchronizing pricing setup components, after installing Oracle Communications Pricing Design Center (PDC).

After installing the complete PDC software, do the following:

1. (Optional) Create additional PDC users by using Oracle WebLogic Remote Console. See "Creating a PDC User".
2. Add your PDC users to a group. This includes the PDC user created during the installation process as well as any additional PDC users you created in step 1. See "Adding the PDC User to a Group".
3. If you are using Elastic Charging Engine (ECE) for usage rating, install the compatible version of ECE on the machine on which ECE is installed. See "Installing Elastic Charging Engine" in *ECE Installation Guide*.

   See *BRM Compatibility Matrix* for the compatible version of ECE.
4. Start the transformation engines. See "Starting the Transformation Engines".
5. (Optional) Restrict the tablespace quota for a schema user. The default tablespace quota is unlimited. See "Restricting Tablespace Quota for a Schema User".
6. Perform the following configuration:
   a. Configure Oracle WebLogic Server to use the SSL-enabled data source. See "Configuring WebLogic Server to use SSL-Enabled Data Source".
   b. Configure PDC to use the SSL-enabled data source. See "Configuring PDC to Connect to SSL-Enabled Database".
7. (Optional) Configure SAML to enable single sign-on (SSO) for PDC. See "Setting Up Single Sign-On for Pricing Design Center".
8. If you are not migrating the existing BRM pricing data to the PDC database, do the following:
   a. Clean up the sample BRM data. See "Cleaning up Sample BRM Data".
   b. Run the **SyncPDC** utility to synchronize the setup components defined in other BRM components with PDC. See "Running SyncPDC".
   c. Create prerequisite setup components, such as balance elements. See "Creating Pricing Setup Components" in *PDC Creating Product Offerings* for more information. For a quick start, load sample balance element IDs and ratable usage metrics (RUMs) provided with the PDC software. See "Loading Sample Data".
   d. Create a service-event map in PDC. See "Creating Service-Event Maps".
9. If you are using PDC REST Services Manager, do the following:
   a. Configure a unique AES master password for each PDC REST Services Manager installation. See "Configuring the PDC REST Services Manager AES Master Password".
   b. Configure the mapping of TMF priceType values to BRM event names. See "Configuring Mapping of TMF620 priceType to BRM Event Names".

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c. Specify the base URL to return. See "Updating the Base URL for PDC REST Services Manager".

Creating a PDC User

If you want to create additional PDC users, you must create the PDC users after the installation is complete.

To create a PDC user:

1. Log in to WebLogic Remote Console.
2. Click **Security Data Tree** and then **Realms**.

   The Summary of Security Realms window appears.
3. Click the **myrealm** link.

   The myrealm configuration page appears.
4. Click **Authentication Providers** in the tree in the left pane.

   A page with an Authentication Provider table appears.
5. In the Authentication Provider table, click **DefaultAuthenticator**.
6. Click **Users** in the tree in the left pane.
7. Click **New**.

   The Create a New User window appears.
8. Do the following:
   a. In the **Name** field, enter a name for the PDC user.
   b. In the **Description** field, enter a brief description for the PDC user.
   c. In the **Password** field, enter a password for the PDC user.

   > **Note**
   > - The PDC user password can be a maximum of 12 characters and should contain at least one non-alphabetic character.
   > - The user name must not be a part of the password.
9. Click **Create**.

   The user name appears in the User table.
10. Click the shopping cart at the top right, and then click **Commit Changes** to commit your changes.

    To access PDC, add the PDC user to a group based on the role of the user in the organization. See "Adding the PDC User to a Group" for more information.

Adding the PDC User to a Group

PDC is a role-based application that authenticates and authorizes users based on the group to which the user belongs. The role-based functionality of PDC is supported by the following WebLogic Server groups:

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- **Pricing Design Admin:** The users belonging to this group have read and write access to the setup and pricing components.
- **Pricing Analyst:** The users belonging to this group have read access to the setup components and read and write access to the pricing components.
- **Pricing Reviewer:** The users belonging to this group have only read access to the setup and pricing components.
- **Migration Admin:** The users belonging to this group can migrate pricing data from the BRM database to the PDC database.

These groups are created by the PDC Installer during the PDC installation process. To access PDC, add the PDC user you created to a group based on the role of the user in the organization.

To add the user to the group:

1. Log in to WebLogic Remote Console.
2. Click **Security Data Tree** and then **Realms**.

   The Summary of Security Realms window appears.
3. Click the **myrealm** link.

   The myrealm configuration page appears.
4. Click **Authentication Providers** in the tree in the left pane.

   A page with an Authentication Provider table appears.
5. In the Authentication Provider table, click **DefaultAuthenticator**.
6. Click **Users** in the tree in the left pane.
7. Click the name of the user in the table.

   The Settings window appears.
8. Click the **Membership** tab.
9. In the **Parent Groups** section, from the **Available** list, select the group to which you want to assign the user.
10. Move the selected item to the **Chosen** list using the **addToChosen** or **addAllToChosen** button.
11. Click **Save**.

Starting the Transformation Engines

The transformation engines do not automatically start when you start the PDC server. You must manually start them by running the following scripts:

- For real-time rating: *BRM_Integration_Pack_home***/Transformation/apps/bin/startRRETransformer**
- For batch rating: *BRM_Integration_Pack_home***/Transformation/apps/bin/startBRETransformer**. This script is optional if you are using ECE for usage rating.

When you run the scripts, at the command prompt, enter the BRM Integration Pack wallet password and start the transformation engines.

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Status of the Transformation Engines

If you suspect that a transformation engine has stopped running, use standard system commands to check the status of the transformation engine process.

Following are the names of the BRM transformation engine processes:

- For real-time rating: **oracle.communications.brm.pdc.server.transformation.rre.RRETransformationEngine**
- For batch rating: **oracle.communications.brm.pdc.server.transformation.bre.BRETransformationEngine**

Restricting Tablespace Quota for a Schema User

PDC grants unlimited tablespace quota to the following schema users:

- PDC schema
- Transformation cross-reference schema
- Migration cross-reference schema

You can restrict the quota limit for a schema user in a tablespace by using SQL*Plus.

To restrict the tablespace quota for a schema user:

1. Connect to your database using SQL*Plus:

   ```
   sqlplus pdcUser@databaseName
   Enter password: password
   ```

   where:

   - *pdcUser* is the PDC database user name.
   - *password* is the PDC database user password.
   - *databaseName* is the service name or database alias of the PDC database.

2. At the SQL*Plus prompt, enter the following command:

   ```
   SQL> alter user schema_user_name  quota size on tablespace_name;
   ```

   where:

   - *schema_user_name* is the PDC schema user name.
   - *size* is the tablespace quota size.
   - *tablespace_name* is the name of the tablespace for the PDC schema user.

   For example:

   ```
   SQL> alter user schema_user_name quota 500k on data_ts;
   ```

3. Type **exit** to exit SQL*Plus.

Configuring WebLogic Server to use SSL-Enabled Data Source

You can use the Secure Sockets Layer (SSL)-enabled data source in Oracle WebLogic Server for secured communications.

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You must configure WebLogic Server before configuring the data sources. For more information on configuring WebLogic Server, see the discussion about using SSL with data sources and Oracle drivers in the Oracle WebLogic Server documentation and in the following page:

https://www.oracle.com/middleware/technologies/weblogic/configure-use-jdbcdriverssl.html

Configuring PDC to Connect to SSL-Enabled Database

To connect to the SSL-enabled database securely for synchronizing, transforming, and migrating the PDC data, you must specify the SSL port number and the database TrustStore details in the following configuration files:

- **SyncPDCConfiguration.xml**
- **TransformationConfiguration.xml**
- **MigrationConfiguration.xml**

To connect to the SSL-enabled database:

1. Open the *BRM_Integration_Pack_home***/apps/***configurationfile* file.

   where:

   - *BRM_Integration_Pack_home* is the directory in which BRM Integration Pack is installed.
   - *configurationfile* is:
     - **SyncPDCConfiguration.xml**
     - **TransformationConfiguration.xml**
     - **MigrationConfiguration.xml**

2. Uncomment the **trustStore** and **truststoreType** section to connect to the database securely:

   ```
   <dbSSLConfiguration>
           <trustStore>databaseTruststoreLocation</trustStore>
       <trustStoreType>databaseTruststoreType</trustStoreType>
   </dbSSLConfiguration>
   ```

   where:

   - *databaseTruststoreLocation* is the path to the client wallet which is used to connect to the database securely.
   - *databaseTruststoreType* is the type of the trustStore used to connect to the database securely:

     If *databaseTruststoreLocation* is **Wallet_Home/cwallet.sso**, the *databaseTruststoreType* is **SSO**.

     If *databaseTruststoreLocation* is **Wallet_Home/ewallet.p12** , the *databaseTruststoreType* is **PKCS12**.

3. Specify the SSL port number in the **connectionInfo** section for all the databases, such as the migration cross-reference database and transformation cross-reference database. For example:

   ```
   <xrefDatabase>
   <connectionInfo>
   ...
   ```


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```
<port>SSL_Port</port>
...
</connectionInfo></xrefDatabase>
```

4. Save and close the file.
5. Go to the *BRM_Integration_Pack_home***/apps/bin** directory.
6. Run the following command, which updates the database TrustStore password in the BRM Integration Pack wallet:

   ```
   ./PDCBRMWalletUtil.sh walletlocation walletpassword DB_TRUSTSTORE_PASSWORD password
   ```

   where:

   - *walletlocation* is the location in which the BRM Integration Pack wallet is located.
   - *walletpassword* is the BRM Integration Pack wallet password.
   - *password* is the database TrustStore password.
7. At the command prompt, enter **Y**.

   The database **TrustStore** password is added to the BRM Integration Pack wallet.

Cleaning up Sample BRM Data

When you install BRM, its installation scripts populate sample data, including setup and pricing components. When using PDC, this data should not be initiated in BRM, but it should be defined in PDC and published to the BRM database. To ensure that PDC and BRM are integrated properly, you must clean up the BRM sample data before you start using PDC.

To clean up sample BRM data:

1. Go to the *BRM_Integration_Pack_Home***/apps/syncpdc/scripts** directory, where *BRM_Integration_Pack_Home* is the directory in which BRM Integration Pack is installed.
2. Enter the following command, which opens SQL*Plus:

   ```
   sqlplus brmUser@databaseName
   Enter password: password
   ```

   where:

   - *brmUser* is the BRM database user name.
   - *password* is the BRM database user password.
   - *databaseName* is the service name or database alias of the BRM database.
3. Enter the following commands, which clean up BRM data:

   > **Note**
   >
   > If PDC is integrated with ECE, do not run the **update_ifw_tables.sql** command.

   - To clean up real-time data:

     ```
     SQL> update_pin_tables.sql
     ```


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- To clean up batch-rating data:

  ```
  SQL> update_ifw_tables.sql
  ```

The sample BRM data is cleaned up.

4. Type **exit** to quit SQL*Plus.

If your BRM system includes a roaming pipeline, you must also perform these additional steps to clean up sample BRM data:

1. Configure a service-event map in PDC. See "Setting Up the Service-Event Map" in *PDC Creating Product Offerings*.
2. Create a charge offer in PDC that has a delayed event with a charge rate plan name as Standard. See "Configuring Charge Offers" in *PDC Creating Product Offerings*.
3. After the charge offer has been created successfully, connect to the BRM database as the pipeline user:

   ```
   sqlplus pipelineUser@databaseName
   Enter password: password
   ```

   where:

   - *pipelineUser* is the user name for accessing the pipeline schema.
   - *password* is the password for the pipeline user.
   - *databaseName* is the service name or database alias of the BRM database.
4. Run the following SQL command:

   ```
   SQL> select RATEPLAN from IFW_RATEPLAN where name like 'Standard';
   ```

   The command returns a RATEPLAN number. Make a note of this number.
5. Make a copy of the *Pipeline_home***/conf/pricingdata/Oracle/ifw_icproduct_all.sql** file.
6. In the copy of the **ifw_icproduct_all.sql** file, do the following:
   - Replace all instances of **RATEPLAN number (20001)** with the following:

     ```
     RATEPLAN number (Number)
     ```

   - Modify the value of ALT_RATEPLAN from NULL to *Number*.

   where *Number* is the RATEPLAN number returned in step 4.

   > **Note**
   >
   > Ensure that IFW_ICPRODUCT_RATE.ALT_RATEPLAN is set to a valid rate plan.

7. Run your copy of the **ifw_icproduct_all.sql** file:

   ```
   SQL> @ifw_icproduct_all.sql
   ```

8. Type **exit** to quit SQL*Plus.

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9. In the *Pipeline_home*/**conf/roaming.reg** file, set **CarrierICRating.Module.UseRateplan** to **ALTERNATIVE**.
10. Start the roaming pipeline.

Running SyncPDC

You must run the **SyncPDC** utility to synchronize the setup components defined outside of PDC.

See "Synchronizing Pricing Setup Components" in *PDC Creating Product Offerings* for more information.

Loading Sample Data

PDC provides sample XML files to create setup components. The sample files are located in the *PDC_home*/**apps/Samples/Examples** directory.

The **Examples** directory contains the following sample files:

- **PDCSampleBE.xml.** Contains all currency balance elements and some frequently used noncurrency balance elements. You can load this file to quickly create balance elements to use when configuring pricing.
- **PDCSampleRum.xml.** Contains commonly used ratable usage metrics (RUMs). You can load this file to quickly create RUMs to use when creating a service-event map and when configuring pricing.
- **OOB_ProfileSpecifications.xml.** Contains the profile attribute specifications referenced in the following custom rules: **Friends&Family**, **SpecialDay**, and **ClosedUserGroup**. This XML file references the names used in the provisioning tags provided by default with the BRM installation. See "Configuring Closed User Groups" in *PDC Creating Product Offerings*.
- **OOB_CRs.xml.** Contains the custom rules: **Friends&Family**, **SpecialDay**, and **ClosedUserGroup**. You can use these custom rules in generic and charge selectors when configuring a charge based on a subscriber's Friends & Family, Special Day, or Closed User Group profile. You must load the **OOB_ProfileSpecifications.xml** file before loading this file. See "Configuring Closed User Groups" in *PDC Creating Product Offerings*.
- **OOB_ItemTypeSelector.xml.** You must load this file if you are using ECE. This file provides the default billing item assignments that are supported by BRM without any additional configuration. See "Configuring Item Type Selectors" in *PDC Creating Product Offerings*.

> **Note**
>
> Before loading this file into the PDC database, make a backup copy of the customized **config_item_tags.xml** and **config_item_types.xml** files in BRM if you have created custom bill items in BRM. When you load the **OOB_ItemTypeSelector.xml** file into the PDC database, it overwrites the existing item tag-to-item type mapping in the BRM database.

You can load the sample files by using the **ImportExportPricing** utility. See "ImportExportPricing" in *PDC Creating Product Offerings* for more information.

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> **Note**
>
> The **Examples** directory also contains sample alias files and sample pricing profile files that are provided only for reference and for use as templates for creating custom alias events or pricing profiles. You should not load the sample alias files and sample pricing profile files after installing PDC.

Creating Service-Event Maps

A service-event map defines which events can be used for a service and which RUMs can be used for each service-event combination. For example, you map the GSM Session event to the GSM service and the RUMs, Duration and Volume, to the GSM Session event.

To create a service-event map:

1. Ensure that the transformation engines are up and running.
2. Launch the PDC UI.
3. Create a service-event map by following the instructions in "Creating Service-Event Maps" in *PDC Online Help*.

   Ensure that you include the following services in the service-event map:

   - **TelcoGprs**
   - **TelcoGsmFax**
   - **TelcoGsmSms**
   - **ServiceSettlementRoamingOutcollect**
   - **ServiceTelcoGsmData**
   - **Service** (**/service**)
   - **ServiceIpGprs**
   - **ServiceTelcoGsmTelephony**
   - **ServiceSettlementRoamingIncollect**
   - **ServiceWapInteractive**

Configuring the PDC REST Services Manager AES Master Password

Before starting PDC REST Services Manager for the first time, you must configure a unique Advanced Encryption Standard (AES) master password and load it into the RSM process environment.

The AES master password is used to encrypt and decrypt sensitive configuration values, such as passwords and client secrets, stored in encrypted form in configuration files. It is not a user login password and is not sent to PDC, BRM, Oracle WebLogic Server, or external services.

Each RSM installation must have its own unique AES master password. Do not use a shared default password.

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> **Note**
>
> - Generate the master password only once for each RSM installation. Do not regenerate or overwrite the environment file after using the password to encrypt sensitive configuration values.
> - Maintain a secure backup of the master password or protected environment file. If the master password is lost, existing encrypted configuration values cannot be decrypted and must be re-encrypted using a new master password.

To configure the RSM AES master password:

1. Log in as the operating system user that runs PDC REST Services Manager.
2. Log in as the operating system user that runs PDC REST Services Manager. Ensure that the **PDC_RSM_home** environment variable is set to the directory in which PDC REST Services Manager is installed.
3. Generate a unique AES master password and save it in a protected environment file by running the following commands:

   ```
   umask 077
   mkdir -p "$PDC_RSM_home/.pdcrsm-secrets"

   MASTER_PASSWORD="$(openssl rand -base64 32)"

   printf 'SECURE_CONFIG_AES_MASTER_PWD=%s\n' "$MASTER_PASSWORD" \
     > "$PDC_RSM_home/.pdcrsm-secrets/rsm.env"

   chmod 600 "$PDC_RSM_home/.pdcrsm-secrets/rsm.env"
   unset MASTER_PASSWORD
   ```

   These commands generate a unique master password and store it in the **rsm.env** file with restricted file permissions.
4. Load the master password into the current shell environment:

   ```
   set -a
   . "$PDC_RSM_home/.pdcrsm-secrets/rsm.env"
   set +a
   ```

   > **Note**
   >
   > - Preserve the **rsm.env** file securely during an uninstall, reinstall, upgrade, or replacement of the installation directory.
   > - Do not add the **rsm.env** file to source control, installation packages, unencrypted backups, or diagnostic bundles.

5. Start PDC REST Services Manager:

   ```
   cd "$PDC_RSM_home/apps/bin"
   ./RestServicesManager.sh start
   ```


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> **Note**
>
> Before running **RestServicesManager.sh** with the **start**, **restart**, or **hash** argument from a new terminal session, load the same environment file into the shell environment:
>
> ```
> set -a
> . "$PDC_RSM_home/.pdcrsm-secrets/rsm.env"
> set +a
> ```

Configuring Mapping of TMF620 priceType to BRM Event Names

If you are using PDC REST Services Manager, you must configure the mappings of BRM event names to the values your enterprise product catalog sends in the **priceType** property of the **ProductOfferingPrice** element of the TMF620 payload.

The mappings are configured in the **application-eventConfig.yaml** file. You can add mappings as needed for your deployment, or use the default mappings provided at installation.

To add or edit mappings:

1. Open the *PDC_RSM_home***/apps/conf/application-eventConfig.yaml** file, where *PDC_RSM_home* is the directory in which you installed PDC REST Services Manager.
2. Edit the existing mappings, or use them as templates to add new ones. Use the following format:

   ```
   pricetype : "eventname"
   ```

   where:

   - *pricetype* is the value sent in the **priceType** property of the **ProductOfferingPrice** element of the TMF620 payload
   - *eventname* is the name of the BRM event the price type should be mapped to

   For example, the default mappings for one-time fees and usage events are:

   ```
   ONE_TIME : "EventBillingProductFeePurchase"
   ONE_TIME_PRICE_PLAN : "EventBillingProductFeePurchase"
   USAGE : "EventSession"
   USAGE_PRICE_PLAN : "EventSession"
   ```

3. Save and close the file.

You can update the mappings as your deployment needs change. After updating configuration files, always restart PDC REST Services Manager using the following command from the *PDC_RSM_home***/apps/bin** directory:

```
./RestServicesManager.sh restart
```

Updating the Base URL for PDC REST Services Manager

After installing PDC REST Services Manager, update the base URL with the resource details to return in the response of PDC REST Services Manager requests. To do so, edit the *PDC_RSM_home***/apps/conf/app_external.properties** file.

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> **Note**
>
> You don't need to restart the PDC REST Services Manager server after editing the **app_external.properties** file.

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Part III

Upgrading Pricing Design Center

This part describes how to upgrade Oracle Communications Pricing Design Center (PDC) to 16.26.0.

> **Note**
>
> - A direct upgrade from PDC 11.x is not supported. If you are upgrading from PDC 11.x, you must upgrade your system to PDC 12.0 first. See *BRM Compatibility Matrix* for BRM 12.0 for information about supported PDC 11.x-to-PDC 12.0 upgrades.
> - For information about the BRM 12.0 releases from which you can directly upgrade to BRM 16.26.0, see *BRM Compatibility Matrix*.

This part contains the following chapters:

- Pricing Design Center Pre-Upgrade Tasks
- Upgrading Pricing Design Center Software
- Pricing Design Center Postinstallation Tasks

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6

Pricing Design Center Pre-Upgrade Tasks

Learn about prerequisite tasks, such as backing up your current installation, before upgrading Oracle Communications Pricing Design Center (PDC) to PDC 16.26.0.

For information about the supported upgrade paths for PDC, see *BRM Compatibility Matrix*. Ensure that you are upgrading PDC from a supported patch set.

To upgrade PDC, do the following:

1. Shut down the current PDC instance. See "Shutting Down the Current Instance".
2. Make a complete offline backup of your existing PDC installation. See "Backing Up the Current Installation".
3. Install the compatible version of BRM on the machine on which BRM is installed.
   - See *BRM Compatibility Matrix* for more information about compatible versions.
   - See *BRM Installation Guide* for information about installing BRM.
4. Install the recommended version of JRE/JDK on the machine on which PDC is installed. See "Installing JRE/JDK".
5. Upgrade the PDC database.

   If you have created a separate database for migration and transformation, upgrade the migration cross-reference database and the transformation cross-reference database. For instructions to upgrade the database, see the Oracle Database upgrade documentation.
6. Configure SSL for the PDC database to ensure secure communications between the PDC application and the database. See "Configuring SSL for the PDC Database".
7. If you have installed PDC and BRM Integration Pack on different machines, copy the client-side KeyStore (**client.jks**) file that you generated to the machine on which BRM Integration Pack is installed.
8. Install the recommended version of WebLogic Server on the machine on which PDC is installed. Perform all of the steps in "Installing and Configuring Oracle WebLogic Server" to install the new version of WebLogic Server.
9. Set the JAVA_HOME environment variable. See "Setting the JAVA_HOME Environment Variable".
10. Enable JRE permissions. See "Enabling JRE Permissions".

Shutting Down the Current Instance

To shut down the current PDC instance:

1. Ensure that no users are logged in.

   Users include customers, client applications, customer service representatives (CSRs), and so on.
2. Stop all PDC processes.

   Only the PDC database instance should be running during the PDC installation or upgrade.

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Backing Up the Current Installation

To prevent any data loss and minimize the impact of software or hardware failure during the upgrade, back up your existing installation.

Before upgrading PDC, make a complete offline backup of the following:

- The WebLogic server **domains** directory; by default, *Middleware_home***/user_projects/domains**.
- The PDC installation directory and its content: *PDC_home*.
- The Oracle Inventory (**oraInventory**) directory. Open the **/etc/oraInst.loc** file to find the default location of the **oraInventory** directory.
- The PDC database schema. See your database documentation for more information on performing full database backups.
- The transformation cross-reference database schema. See your database documentation for more information on performing full database backups.

> **Note**
>
> Store this backup in a safe location. The data in these files will become necessary if you encounter any issues in the installation process.

- The migration cross-reference database schema if installed. See your database documentation for more information on performing full database backups.

Installing JRE/JDK

Install the recommended version of JRE/JDK on the machine on which you want to deploy PDC. See *BRM Compatibility Matrix* for the recommended version of JRE/JDK.

To verify the JRE/JDK version:

1. Go to the command prompt on the machine on which you want to deploy PDC.
2. Enter the following command:

   ```
   java -version
   ```

   The Java version is displayed.

   The version displayed should be the recommended version from the *BRM Compatibility Matrix*.

For information about installing JRE/JDK, see the Oracle Java documentation.

Configuring SSL for the PDC Database

You can configure secure sockets layer (SSL) for the Oracle database by creating wallets for storing certificates and then modifying the following configuration files:

- **sqlnet.ora**
- **tnsnames.ora**

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- **listener.ora**

You can use the **Orapki** utility to create the wallets.

For information about configuring SSL for the Oracle database, see the Oracle Database documentation.

Setting the JAVA_HOME Environment Variable

Set the **JAVA_HOME** environment variable to the recommended version of JRE/JDK before running any PDC processes. See *BRM Compatibility Matrix* for the recommended version of JRE/JDK.

Set the **JAVA_HOME** environment variable on the machine on which you want to deploy PDC. For example, in C-shell:

1. Open the **.cshrc** file in a text editor.
2. Add or modify the following entries:

   ```
   setenv JAVA_HOME jre/jdk_path
   ```

   where *jre/jdk_path* is the absolute path to the directory in which JRE/JDK is installed.
3. Save and close the file.
4. Update the environment by running the following command:

   ```
   source .cshrc
   ```
5. Verify the Java version by running the following command:

   ```
   $JAVA_HOME/bin/java -version
   ```

   The Java version is displayed.

To set the JAVA_HOME environment variable for the WebLogic Server domain:

1. Open the *Domain_home***/bin/setDomainEnv.sh** file in a text editor.
2. Add or modify the following entries before the **EXTRA_JAVA_PROPERTIES** entry:

   ```
   JAVA_HOME="${JAVA_HOME}"
   export JAVA_HOME
   ```
3. Save and close the file.

Enabling JRE Permissions

To enable JRE permissions:

1. Go to the *jre/jdk_path***/lib/security** directory.
2. Open the **java.policy** file in a text editor.
3. Add the following entries to the file:

   ```
   grant { // JMX Java Management eXtensions
             permission javax.management.MBeanTrustPermission "register";
   };
   ```
4. Save and close the file.

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Enabling the SSL Port for the WebLogic Server Domain

Before installing PDC the new version of PDC, enable the SSL port for the WebLogic Server domain in which you deployed PDC, if it is not enabled during the WebLogic Server domain creation. You must enable the SSL port even if you are not configuring SSL for the WebLogic Server domain.

To enable the SSL port for the WebLogic Server domain:

1. Start the WebLogic Server domain.
2. Log in to WebLogic Remote Console.
3. Click **Edit Tree**, then **Environment**, and then **Servers**.

   The Summary of Servers appears.
4. Select the server in which you want to deploy PDC.
5. Click the **General** subtab.
6. Turn on **SSL Listen Port Enabled**.
7. In the **SSL Listen Port** field, enter a free port number.
8. Click **Save**.
9. Click the shopping cart at the top right, and then click **Commit Changes** to commit your changes.
10. Restart the WebLogic Server domain.

See "Specify Listen Ports" in Oracle WebLogic Remote Console Online Help for more information.

Configuring the SSL Protocol Version

In a production environment, Oracle recommends using the SSL protocol for sending and receiving messages.

> **Note**
>
> You need to set the same protocol version for managed servers and the administration server. Ensure that all the managed servers are down when making changes to the administration server for setting up the protocol. Oracle recommends to set the properties in the administration server and then the managed server.

When PDC is acting as a server, you can set the minimum protocol version of TLS to be used by specifying the following as a command-line option in the WebLogic Server startup parameters.

You can set the minimum version to TLS 1.2 using this command:

```
-Dweblogic.security.SSL.minimumProtocolVersion=TLSv1.2
```


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You can set the minimum version to TLS 1.3 using this command:

```
-Dweblogic.security.SSL.minimumProtocolVersion=TLSv1.3
```

> **Note**
>
> When you set a minimum protocol version, the TLS protocol that is enabled depends on the protocols that are configured in the SSL implementation.

WebLogic Server supports both TLS 1.2 and TLS 1.3 by default when PDC is acting as a client, so no configuration is necessary to set that value.

See "Specifying the SSL/TLS Protocol Version" in *Administering Security for Oracle WebLogic Server* for more information.

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7

Upgrading Pricing Design Center Software

Learn how to upgrade Oracle Communications Pricing Design Center (PDC) software and the Oracle Communications Billing and Revenue Management (BRM) Integration Pack.

Topics in this document:

- About Upgrading PDC
- Upgrading PDC in GUI Mode
- Upgrading PDC in Silent Mode
- Rolling Back an Unsuccessful Upgrade
- Rolling Back a Successful Upgrade

About Upgrading PDC

You can upgrade PDC in GUI mode or silent mode. Upgrading PDC in silent mode lets you perform a non-interactive upgrade of PDC. You can use the silent mode to upgrade PDC quickly.

A PDC upgrade must be performed by a user who has permissions to write to the **oraInventory** directory and the *Middleware_home***/user_projects/domains** directory, where *Middleware_home* is the directory in which the Oracle Middleware components are installed.

Upgrading PDC in GUI Mode

The steps for upgrading PDC by using the GUI depend on the PDC components you choose to upgrade:

- To upgrade both PDC and BRM Integration Pack installed on the same machine, select the **Upgrade-Complete** installation option. See "Upgrading Both PDC and BRM Integration Pack".
- To upgrade only PDC, select the **Pricing Design Center Upgrade** installation option. See "Upgrading Only the PDC Software".
- To upgrade only BRM Integration Pack, select the **BRM Integration Pack Upgrade** installation option. See "Upgrading Only BRM Integration Pack".

Upgrading Both PDC and BRM Integration Pack

To upgrade an existing PDC and BRM Integration Pack installation on the same machine:

1. Obtain the PDC software. See "Downloading the PDC Software".
2. Start the new version of the Oracle WebLogic Server domain administration server or managed server on which you intend to deploy PDC, if it is not already started.
3. Ensure that the PDC database is running.

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> **Note**
>
> Ensure that the Oracle Database server is in Running state. The Installer connects to the Oracle Database server to verify the information you entered is valid.

4. Go to the *temp_dir* directory, and run one of the following commands:
   - To start the GUI installer:

     ```
     Java_home/bin/java -jar jarfile
     ```

     where:
     - *Java_home* is the directory in which you installed the latest supported Java version.
     - *jarfile* is the PDC installer file, for example **pdcserver-16.26.0.0.0.0_generic_full.jar**.
   - To start the GUI installer and install PDC using the **oraInventory** directory in a different location:

     ```
     Java_home/bin/java -jar jarfile -invPtrLoc Inventory_home/oraInst.loc
     ```

     where *Inventory_home* is the location of the Oracle inventory.
   - To start the GUI installer and create a silent installer response file during the installation:

     ```
     Java_home/bin/java -jar jarfile -record -destinationFile path
     ```

     where *path* is the response file location and name.

   The Welcome window appears.
5. Click **Next**.

   The Installation Location window appears.
6. Enter the full path or browse to the directory in which you want to install PDC and BRM Integration Pack for PDC.

> **Note**
>
> Ensure that you do not enter the path to the same directory in which the old version of PDC is installed. You can install the new version of PDC in a different directory on the same machine.

7. Click **Next**.

   The Select Installation Type window appears.
8. Select **Upgrade Complete** and click **Next**.

   The PDC WebLogic Server window appears.
9. Enter the following details for the WebLogic Server domain in which you want to deploy PDC:
   a. In the **Host Name** field, enter the IP address or the host name of the machine on which the WebLogic Server domain is configured.

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b. In the **Port Number** field, enter the port number assigned to the WebLogic Server domain administration server.

c. In the **User Name** field, enter the WebLogic Server domain administrator user name.

d. In the **Password** field, enter the WebLogic Server domain administrator user password.

e. In the **WebLogic Home** field, enter the path to the directory in which the WebLogic Server software is installed. For example, *Middleware_home***/wlserver**.

f. To enable secure communication for PDC, select the **Enable SSL? (Recommended)** check box, and in the **KeyStore Location** field, enter the path of the client-side KeyStore file generated from the exported public certificate using the **keytool** utility.

For more information, see "Configuring SSL for the WebLogic Server Domain".

g. To allow the import and export of large XML files into PDC, select **Apply WebLogic tuning parameters**. For information about the WebLogic tuning parameters, see the installer Help.

> **Note**
>
> If you select this check box, you must restart the WebLogic Server domain after PDC installs successfully.

10. Click **Next**.

The WebLogic Server window appears.

11. Do one of the following:

- If the existing PDC installation is deployed on the WebLogic Server domain administration server, select a WebLogic Server domain administration server from the list.
- If the existing PDC installation is deployed on the WebLogic Server domain managed server, select a WebLogic Server domain managed server from the list.

12. Enter the following details for the PDC wallet:

a. In the **Wallet Location** field, enter the path to the directory in which the PDC wallet is located or is to be installed.

b. In the **Wallet Password** field, enter the PDC wallet password.

c. In the **Confirm Wallet Password** field, enter the PDC wallet password again.

13. Click **Next**.

The Pricing Design Center Schema window appears.

14. Enter the following information required to connect to the PDC database:

a. In the **Host Name** field, enter the IP address or the host name of the machine for the existing (upgraded) PDC database.

b. In the **Port Number** field, enter the port number assigned to the PDC database service.

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> **Note**
>
> If the database is SSL-enabled, enter the SSL port number in the **Port Number** field.

c. In the **User Name** field, enter the PDC database user name.

   This user should be the SYSDBA user or should have the following capabilities on the PDC database: grant create user, grant any role, grant any privileges, select any table to *username*, and grant sysdba to *username*.

d. In the **Password** field, enter the PDC database user password.

e. In the **Service Name** field, enter the name of the PDC database service.

> **Note**
>
> Ensure that the Oracle Database server is in Running state. The Installer connects to the Oracle Database server to verify the information you entered is valid.

f. From the **SSL** list, select the type of SSL connection required for connecting to the PDC database:

   - **No**: SSL authentication is not required.
   - **Yes-One Way**: One-way SSL authentication is required. In this case, the client must authenticate the server's identity.
   - **Yes-Two Way**: Two-way SSL authentication is required. In this case, both the client and server must authenticate each others identity.

g. If you selected **Yes-One Way** or **Yes-Two Way**, do the following:

   - From the **Wallet Type** list, select the type of wallet to use for secure communication with the database: **SSO** or **PKCS12**.
   - In the **Truststore Wallet Location** field, enter the full path to the directory in which the database wallet is located.
   - In the **Truststore Wallet Password** field, enter the TrustStore wallet password to be used for secure communication.
   - In the **Keystore Wallet Location** field, enter the full path or browse to the directory in which the database wallet is located.
   - In the **Keystore Wallet Password** field, enter the KeyStore wallet password to be used for secure communication.

15. Click **Next**.

    The Pricing Design Center System User window appears.

16. Enter the existing PDC user information.

    a. In the **User Name** field, enter the name of the PDC user that you created during the PDC 12.0 or 15.0.*x* installation.

    b. In the **Password** field, enter the password of the PDC user that you created during the PDC 12.0 or 15.0.*x* installation.

17. Do one of the following:

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- If you selected Oracle Communications Billing and Revenue Management Elastic Charging Engine (ECE) for usage rating during the PDC 12.0 or 15.0.*x* installation, select **Elastic Charging Engine**.
- If you selected BRM real-time rating and batch rating engines for usage rating during the PDC 12.0 or 15.0.*x* installation, select **Realtime Rating and Batch Rating Engines**.

> **Note**
>
> If you are using real-time and batch rating engines for usage rating, and you want to use ECE for usage rating, after the PDC upgrade, install PDC with ECE and then migrate the pricing data from the source PDC database into the target PDC database.
>
> See "Migrating Pricing Data to PDC With ECE" in *BRM System Administrator's Guide*.

18. Click **Next**.

    The Migration Option window appears.

19. Do one of the following:

> **Note**
>
> Ensure that you select the same option that you selected during the PDC 12.0 or 15.0.*x* installation.

- If you do not want to install the migration utility, select **Do not install Migration Utility**.
- To migrate the BRM real-time and batch rating engines pricing data to a PDC system that supports BRM real-time and batch rating engines, select **Migrate RRE and BRE Pricing Data to PDC**.
- To migrate the BRM real-time and batch rating engines pricing data to a PDC system that supports ECE, select **Migrate RRE and BRE Pricing Data to PDC with ECE**.
- To migrate the PDC pricing data to a PDC system that supports ECE, select **Migrate PDC Pricing Data to PDC with ECE**.

20. Click **Next**.

    The Pricing Design Center WebLogic Server Connection window appears.

21. Enter the WebLogic Server domain (the domain on which you deployed the existing PDC installation) information.

    a. In the **Host Name** field, enter the IP address or the host name of the machine on which the WebLogic Server domain is configured.

    b. In the **Port Number** field, enter the port number assigned to the WebLogic Server domain administration server.

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> **Note**
>
> If you selected a WebLogic Server domain managed server in step 11, enter the port number to the managed server.

c. In the **User Name** field, enter the WebLogic Server domain administrator user name.

d. In the **Password** field, enter the WebLogic Server domain administrator password.

e. In the **WebLogic Home** field, enter the path to the directory in which the WebLogic Server software is installed.

f. Do one of the following:

- If you do not want to enable secure communication for PDC, deselect the **Use SSL?** check box.
- To enable secure communication for PDC, leave the **Use SSL?** check box selected, and, in the **Keystore Location** field, enter the path of the client-side KeyStore file generated from the exported public certificate using the **keytool** utility.

  For more information, see "Configuring SSL for the WebLogic Server Domain".

22. Click **Next**.

    The BRM Integration Pack Wallet Location and Password window appears.

23. Enter the following details for the BRM Integration Pack wallet:

    a. In the **Wallet Location** field, enter the path to the directory in which the BRM Integration Pack wallet is located or is to be installed.

    b. In the **Wallet Password** field, enter the BRM Integration Pack wallet password.

    c. In the **Confirm Wallet Password** field, enter the BRM Integration Pack wallet password again.

24. Click **Next**.

    The BRM Server Location window appears.

25. Enter the existing BRM batch and real-time rating engine details.

    a. In the **BRM** field, enter the path to the directory in which BRM is installed.

    b. In the **BRM Pipeline** field, enter the path to the directory in which Pipeline Manager is installed.

    c. In the **Perl Home** field, enter the path to the directory in which the Perl libraries are installed.

26. Click **Next**.

    The BRM Pipeline Database Connection window appears.

27. Enter the following information required to connect to the BRM pipeline database:

    a. In the **Host Name** field, enter the IP address or the host name of the machine on which to create the BRM pipeline database schema.

    b. In the **Port Number** field, enter the port number assigned to the BRM pipeline database service.

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> **Note**
>
> If the database is SSL-enabled, enter the SSL port number in the **Port Number** field.

c. In the **User Name** field, enter the BRM pipeline database user name.

   This user should be the SYSDBA user or should have the following capabilities on the BRM pipeline database: grant create user, grant any role, grant any privileges, select any table to *username*, and grant sysdba to *username*.

d. In the **Password** field, enter the BRM pipeline database user password.

e. In the **Service Name** field, enter the name of the BRM pipeline database service.

> **Note**
>
> Ensure that the Oracle Database server is in Running state. The Installer connects to the Oracle Database server to verify the information you entered is valid.

f. From the **SSL** list, select the type of SSL connection required for connecting to the BRM pipeline database:

   - **No**: SSL authentication is not required.
   - **Yes-One Way**: One-way SSL authentication is required. In this case, the client must authenticate the server's identity.
   - **Yes-Two Way**: Two-way SSL authentication is required. In this case, both the client and server must authenticate each others identity.

g. If you selected **Yes-One Way** or **Yes-Two Way**, do the following:

   - From the **Wallet Type** list, select the type of wallet to use for secure communication with the database: **SSO** or **PKCS12**.
   - In the **Truststore Wallet Location** field, enter the full path to the directory in which the database wallet is located.
   - In the **Truststore Wallet Password** field, enter the TrustStore wallet password to be used for secure communication.
   - In the **Keystore Wallet Location** field, enter the full path or browse to the directory in which the database wallet is located.
   - In the **Keystore Wallet Password** field, enter the KeyStore wallet password to be used for secure communication.

28. Click **Next**.

    The PDC Cross-Reference Schema window appears.

29. Enter the following information required to connect to the PDC cross-reference database:

    a. In the **Host Name** field, enter the IP address or the host name of the machine on which to create the PDC cross-reference schema.

    b. In the **Port Number** field, enter the port number assigned to the PDC cross-reference database service.

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> **Note**
>
> If the database is SSL-enabled, enter the SSL port number in the **Port Number** field.

c. In the **User Name** field, enter the PDC cross-reference database user name.

   This user should be the SYSDBA user or should have the following capabilities on the PDC cross-reference database: grant create user, grant any role, grant any privileges, select any table to *username*, and grant sysdba to *username*.

d. In the **Password** field, enter the PDC cross-reference database user password.

e. In the **Service Name** field, enter the name of the PDC cross-reference database service.

> **Note**
>
> Ensure that the Oracle Database server is in Running state. The Installer connects to the Oracle Database server to verify the information you entered is valid.

f. From the **SSL** list, select the type of SSL connection required for connecting to the PDC cross-reference database:

   - **No**: SSL authentication is not required.
   - **Yes-One Way**: One-way SSL authentication is required. In this case, the client must authenticate the server's identity.
   - **Yes-Two Way**: Two-way SSL authentication is required. In this case, both the client and server must authenticate each others identity.

g. If you selected **Yes-One Way** or **Yes-Two Way**, do the following:

   - From the **Wallet Type** list, select the type of wallet to use for secure communication with the database: **SSO** or **PKCS12**.
   - In the **Truststore Wallet Location** field, enter the full path to the directory in which the database wallet is located.
   - In the **Truststore Wallet Password** field, enter the TrustStore wallet password to be used for secure communication.
   - In the **Keystore Wallet Location** field, enter the full path or browse to the directory in which the database wallet is located.
   - In the **Keystore Wallet Password** field, enter the KeyStore wallet password to be used for secure communication.

30. Click **Next**.

    The Pricing Design Center System User window appears.

31. Enter the existing PDC user information.

    a. In the **User Name** field, enter the name of the PDC user that you created during the PDC 12.0 or 15.0.*x* installation.

    b. In the **Password** field, enter the password of the PDC user that you created during the PDC 12.0 or 15.0.*x* installation.

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32. Click **Next**.

    The Migration Cross-Reference Schema window appears. If you selected **Do not install Migration Utility** in step 19, proceed to step 36.

33. Enter the following information required to connect to the migration cross-reference database:

    a. In the **Host Name** field, enter the IP address or the host name of the machine on which to create the migration cross-reference database schema.

    b. In the **Port Number** field, enter the port number assigned to the migration cross-reference database service.

    > **Note**
    >
    > If the database is SSL-enabled, enter the SSL port number in the **Port Number** field.

    c. In the **User Name** field, enter the migration cross-reference database user name.

    This user should be the SYSDBA user or should have the following capabilities on the migration cross-reference database: grant create user, grant any role, grant any privileges, select any table to *username*, and grant sysdba to *username*.

    d. In the **Password** field, enter the migration cross-reference database user password.

    e. In the **Service Name** field, enter the name of the migration cross-reference database service.

    > **Note**
    >
    > Ensure that the Oracle Database server is in Running state. The Installer connects to the Oracle Database server to verify the information you entered is valid.

    f. From the **SSL** list, select the type of SSL connection required for connecting to the migration cross-reference database:

    - **No**: SSL authentication is not required.
    - **Yes-One Way**: One-way SSL authentication is required. In this case, the client must authenticate the server's identity.
    - **Yes-Two Way**: Two-way SSL authentication is required. In this case, both the client and server must authenticate each others identity.

    g. If you selected **Yes-One Way** or **Yes-Two Way**, do the following:

    - From the **Wallet Type** list, select the type of wallet to use for secure communication with the database: **SSO** or **PKCS12**.
    - In the **Truststore Wallet Location** field, enter the full path to the directory in which the database wallet is located.
    - In the **Truststore Wallet Password** field, enter the TrustStore wallet password to be used for secure communication.
    - In the **Keystore Wallet Location** field, enter the full path or browse to the directory in which the database wallet is located.

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- In the **Keystore Wallet Password** field, enter the KeyStore wallet password to be used for secure communication.

34. Click **Next**.

    The Migration User window appears.

35. Enter the migration user information.

    a. In the **User Name** field, enter the migration user name.

    b. In the **Password** field, enter the migration user password.

36. Click **Next**.

    The Installation Summary window appears.

37. Review the selections you have made in the preceding windows, and click **Install**.

    The Installation Progress window appears.

> **Note**
>
> After the installation begins, clicking **Stop installation** stops the installation process, but the files that are already copied are not removed.

38. When the installation is done, click **Next**. The Installation Complete window appears.

    Note down the provided URL, because you will need it to access PDC.

39. Click **Finish** to complete and exit.

40. If you selected **Apply WebLogic tuning parameters**, you must restart the WebLogic Server domain.

See "Verifying the Pricing Design Center Installation" for information on verifying the successful installation of PDC.

See "About Installation Logs" for information on PDC Installer logs.

Upgrading Only the PDC Software

To upgrade PDC:

1. Obtain the PDC software. See "Downloading the PDC Software".
2. Start the Oracle WebLogic Server domain administration server or the WebLogic Server domain managed server on which your old version of PDC was deployed, if it is not already started.
3. Ensure that the PDC database is running.

> **Note**
>
> Ensure that the Oracle Database server is in Running state. The Installer connects to the Oracle Database server to verify the information you entered is valid.

4. Go to the *temp_dir* directory, and run one of the following commands:

    - To start the GUI installer:

      ```
      Java_home/bin/java -jar jarfile
      ```


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where:

- *Java_home* is the directory in which you installed the latest supported Java version.
- *jarfile* is the PDC installer file, for example **pdcserver-16.26.0.0.0.0_generic_full.jar**.

- To start the GUI installer and install PDC using the **oraInventory** directory in a different location:

  ```
  Java_home/bin/java -jar jarfile -invPtrLoc Inventory_home/oraInst.loc
  ```

  where *Inventory_home* is the location of the Oracle inventory.

- To start the GUI installer and create a silent installer response file during the installation:

  ```
  Java_home/bin/java -jar jarfile -record -destinationFile path
  ```

  where *path* is the response file location and name.

The Welcome window appears.

5. Click **Next**.

   The Installation Location window appears.

6. Enter the full path or browse to the directory in which you want to install the new version of PDC.

   > **Note**
   >
   > Ensure that you do not enter the path to the directory in which the old version of PDC is installed.

7. Click **Next**.

   The Select Installation Type window appears.

8. Select **Pricing Design Center Upgrade** and click **Next**.

   The PDC WebLogic Server window appears.

9. Enter the following details for the WebLogic Server domain in which you want to deploy PDC:

   a. In the **Host Name** field, enter the IP address or the host name of the machine on which the WebLogic Server domain is configured.

   b. In the **Port Number** field, enter the port number assigned to the WebLogic Server domain administration server.

   c. In the **User Name** field, enter the WebLogic Server domain administrator user name.

   d. In the **Password** field, enter the WebLogic Server domain administrator user password.

   e. In the **WebLogic Home** field, enter the path to the directory in which the WebLogic Server software is installed. For example, *Middleware_home***/wlserver**.

   f. To enable secure communication for PDC, select the **Enable SSL? (Recommended)** check box, and in the **KeyStore Location** field, enter the path of the client-side KeyStore file generated from the exported public certificate using the **keytool** utility.

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For more information, see "Configuring SSL for the WebLogic Server Domain".

g. To allow the import and export of large XML files into PDC, select **Apply WebLogic tuning parameters**. For information about the WebLogic tuning parameters, see the installer Help.

> **Note**
>
> If you select this check box, you must restart the WebLogic Server domain after PDC installs successfully.

10. In the PDC Wallet Details window, enter the following details for the PDC wallet:
    a. In the **Wallet Location** field, enter the path to the directory in which the PDC wallet is located or is to be installed.
    b. In the **Wallet Password** field, enter the PDC wallet password.
    c. In the **Confirm Wallet Password** field, enter the PDC wallet password again.
11. Click **Next**.

    The WebLogic Server window appears.
12. Do one of the following:
    - If the existing PDC installation is deployed on the WebLogic Server domain administration server, select a WebLogic Server domain administration server from the list.
    - If the existing PDC installation is deployed on the WebLogic Server domain managed server, select a WebLogic Server domain managed server from the list.
13. Click **Next**.

    The Pricing Design Center Schema window appears.
14. Enter the following information required to connect to the PDC database:
    a. In the **Host Name** field, enter the IP address or the host name of the machine on which to create the PDC database schema.
    b. In the **Port Number** field, enter the port number assigned to the PDC database service.

> **Note**
>
> If the database is SSL-enabled, enter the SSL port number in the **Port Number** field.

    c. In the **User Name** field, enter the PDC database user name.

    This user should be the SYSDBA user or should have the following capabilities on the PDC database: grant create user, grant any role, grant any privileges, select any table to *username*, and grant sysdba to *username*.
    d. In the **Password** field, enter the PDC database user password.
    e. In the **Service Name** field, enter the name of the PDC database service.

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> **Note**
>
> Ensure that the Oracle Database server is in Running state. The Installer connects to the Oracle Database server to verify the information you entered is valid.

f. From the **SSL** list, select the type of SSL connection required for connecting to the PDC database:

- **No**: SSL authentication is not required.
- **Yes-One Way**: One-way SSL authentication is required. In this case, the client must authenticate the server's identity.
- **Yes-Two Way**: Two-way SSL authentication is required. In this case, both the client and server must authenticate each others identity.

g. If you selected **Yes-One Way** or **Yes-Two Way**, do the following:

- From the **Wallet Type** list, select the type of wallet to use for secure communication with the database: **SSO** or **PKCS12**.
- In the **Truststore Wallet Location** field, enter the full path to the directory in which the database wallet is located.
- In the **Truststore Wallet Password** field, enter the TrustStore wallet password to be used for secure communication.
- In the **Keystore Wallet Location** field, enter the full path or browse to the directory in which the database wallet is located.
- In the **Keystore Wallet Password** field, enter the KeyStore wallet password to be used for secure communication.

15. Click **Next**.

    The Pricing Design Center System User window appears.

16. Enter the existing PDC user information.

    a. In the **User Name** field, enter the name of the PDC user that you created during the PDC 12.0 or 15.0.*x* installation.

    b. In the **Password** field, enter the password of the PDC user that you created during the PDC 12.0 or 15.0.*x* installation.

    c. In the **Confirm Password** field, enter the PDC user password again.

17. Do one of the following:

- If you selected Oracle Communications Billing and Revenue Management Elastic Charging Engine (ECE) for usage rating during the PDC 12.0 or 15.0.*x* installation, select **Elastic Charging Engine**.
- If you selected BRM real-time rating and batch rating engines for usage rating during the PDC 12.0 or 15.0.*x* installation, select **Realtime Rating and Batch Rating Engines**.

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> **Note**
>
> If you are using real-time and batch rating engines for usage rating, and you want to use ECE for usage rating, after the PDC upgrade, install PDC with ECE and then migrate the pricing data from the source PDC database into the target PDC database.
>
> See the discussion about migrating PDC pricing data to PDC With ECE in *BRM Upgrade Guide*.

18. Click **Next**.

    The Installation Summary window appears.

19. Review the selections you have made in the preceding windows, and click **Install**.

    The Installation Progress window appears.

> **Note**
>
> After the installation begins, clicking **Stop installation** stops the installation process, but the files that are already copied are not removed.

20. When the installation is done, click **Next**. The Installation Complete window appears.

    Note down the provided URL, because you will need it to access PDC.

21. Click **Finish** to complete and exit.

22. If you selected **Apply WebLogic tuning parameters**, you must restart the WebLogic Server domain.

See "Verifying the Pricing Design Center Installation" for information on verifying the successful installation of PDC.

See "About Installation Logs" for information on PDC Installer logs.

Upgrading Only BRM Integration Pack

> **Note**
>
> The BRM Integration Pack installation must be performed as the Linux user who installed BRM; for example, **pin_user**.

To upgrade only BRM Integration Pack:

1. Obtain the PDC software. See "Downloading the PDC Software".
2. Start the Oracle WebLogic Server domain administration server or the WebLogic Server domain managed server on which your old version of PDC was deployed, if it is not already started.
3. Verify that you can connect to the BRM database.
4. Go to the *temp_dir* directory, and run one of the following commands:
   - To start the GUI installer:

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```
Java_home/bin/java -jar jarfile
```

where:

- *Java_home* is the directory in which you installed the latest supported Java version.
- *jarfile* is the PDC installer file, for example **pdcserver-16.26.0.0.0.0_generic_full.jar**.

- To start the GUI installer and install PDC using the **oraInventory** directory in a different location:

  ```
  Java_home/bin/java -jar jarfile -invPtrLoc Inventory_home/oraInst.loc
  ```

  where *Inventory_home* is the location of the Oracle inventory.

- To start the GUI installer and create a silent installer response file during the installation:

  ```
  Java_home/bin/java -jar jarfile -record -destinationFile path
  ```

  where *path* is the response file location and name.

The Welcome window appears.

5. Click **Next**.

   The Installation Location window appears.

6. Enter the full path or browse to the directory in which you want to install BRM Integration Pack for the new PDC installation.

   > **Note**
   >
   > Ensure that you do not enter the path to the directory in which the old version of the BRM Integration Pack for PDC is installed.

7. Click **Next**.

   The Select Installation Type window appears.

8. Select **BRM Integration Pack Upgrade** and click **Next**.

   The Migration Option window appears.

9. Do one of the following:

   > **Note**
   >
   > Ensure that you select the same option that you selected during the PDC 12.0 or 15.0.*x* installation.

   - If you do not want to migrate data, select **Do not install Migration Utility**.
   - To migrate the BRM real-time and batch rating engines pricing data to a PDC system that supports BRM real-time and batch rating engines, select **Migrate RRE and BRE Pricing Data to PDC**.
   - To migrate the BRM real-time and batch rating engines pricing data to a PDC system that supports ECE, select **Migrate RRE and BRE Pricing Data to PDC with ECE**.

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- To migrate the PDC pricing data to a PDC system that supports ECE, select **Migrate PDC Pricing Data to PDC with ECE**.

10. Click **Next**.

    The Pricing Design Center WebLogic Server Connection window appears.

11. Enter the WebLogic Server domain (the domain on which you deployed the existing PDC installation) information.

    a. In the **Host Name** field, enter the IP address or the host name of the machine on which the WebLogic Server domain is configured.

    b. In the **Port Number** field, enter the port number assigned to the WebLogic Server domain administration server.

    > **Note**
    >
    > If you selected a WebLogic Server domain managed server during the PDC installation, enter the port number of the managed server.

    c. In the **User Name** field, enter the WebLogic Server domain administrator user name.

    d. In the **Password** field, enter the WebLogic Server domain administrator password.

    e. Do one of the following:

    - If you do not want to enable secure communication for PDC, deselect the **Enable SSL?** check box.
    - To enable secure communication for PDC, leave the **Enable SSL?** check box selected, and, in the **Keystore Location** field, enter the path of the client-side KeyStore file generated from the exported public certificate using the **keytool** utility.

      For more information, see "Configuring SSL for the WebLogic Server Domain".

12. Click **Next**.

    The BRM Server Location window appears.

13. Enter the existing BRM batch and real-time rating engine details.

    a. In the **BRM** field, enter the path to the directory in which BRM is installed.

    b. In the **BRM Pipeline** field, enter the path to the directory in which Pipeline Manager is installed.

    c. In the **Perl Home** field, enter the path to the directory in which the Perl libraries are installed.

14. Click **Next**.

    The BRM Pipeline Database Connection window appears.

15. Enter the following information required to connect to the BRM pipeline database:

    a. In the **Host Name** field, enter the IP address or the host name of the machine on which to create the BRM pipeline database schema.

    b. In the **Port Number** field, enter the port number assigned to the BRM pipeline database service.

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> **Note**
>
> If the database is SSL-enabled, enter the SSL port number in the **Port Number** field.

c. In the **User Name** field, enter the BRM pipeline database user name.

   This user should be the SYSDBA user or should have the following capabilities on the BRM pipeline database: grant create user, grant any role, grant any privileges, select any table to *username*, and grant sysdba to *username*.

d. In the **Password** field, enter the BRM pipeline database user password.

e. In the **Service Name** field, enter the name of the BRM pipeline database service.

> **Note**
>
> Ensure that the Oracle Database server is in Running state. The Installer connects to the Oracle Database server to verify the information you entered is valid.

f. From the **SSL** list, select the type of SSL connection required for connecting to the BRM pipeline database:

   - **No**: SSL authentication is not required.
   - **Yes-One Way**: One-way SSL authentication is required. In this case, the client must authenticate the server's identity.
   - **Yes-Two Way**: Two-way SSL authentication is required. In this case, both the client and server must authenticate each others identity.

g. If you selected **Yes-One Way** or **Yes-Two Way**, do the following:

   - From the **Wallet Type** list, select the type of wallet to use for secure communication with the database: **SSO** or **PKCS12**.
   - In the **Truststore Wallet Location** field, enter the full path to the directory in which the database wallet is located.
   - In the **Truststore Wallet Password** field, enter the TrustStore wallet password to be used for secure communication.
   - In the **Keystore Wallet Location** field, enter the full path or browse to the directory in which the database wallet is located.
   - In the **Keystore Wallet Password** field, enter the KeyStore wallet password to be used for secure communication.

16. Click **Next**.

    The PDC Cross-Reference Schema window appears.

17. Enter the following information required to connect to the PDC cross-reference database:

    a. In the **Host Name** field, enter the IP address or the host name of the machine on which to create the PDC cross-reference schema.

    b. In the **Port Number** field, enter the port number assigned to the PDC cross-reference database service.

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> **Note**
>
> If the database is SSL-enabled, enter the SSL port number in the **Port Number** field.

c. In the **User Name** field, enter the PDC cross-reference database user name.

   This user should be the SYSDBA user or should have the following capabilities on the PDC cross-reference database: grant create user, grant any role, grant any privileges, select any table to *username*, and grant sysdba to *username*.

d. In the **Password** field, enter the PDC cross-reference database user password.

e. In the **Service Name** field, enter the name of the PDC cross-reference database service.

> **Note**
>
> Ensure that the Oracle Database server is in Running state. The Installer connects to the Oracle Database server to verify the information you entered is valid.

f. From the **SSL** list, select the type of SSL connection required for connecting to the PDC cross-reference database:

   - **No**: SSL authentication is not required.
   - **Yes-One Way**: One-way SSL authentication is required. In this case, the client must authenticate the server's identity.
   - **Yes-Two Way**: Two-way SSL authentication is required. In this case, both the client and server must authenticate each others identity.

g. If you selected **Yes-One Way** or **Yes-Two Way**, do the following:

   - From the **Wallet Type** list, select the type of wallet to use for secure communication with the database: **SSO** or **PKCS12**.
   - In the **Truststore Wallet Location** field, enter the full path to the directory in which the database wallet is located.
   - In the **Truststore Wallet Password** field, enter the TrustStore wallet password to be used for secure communication.
   - In the **Keystore Wallet Location** field, enter the full path or browse to the directory in which the database wallet is located.
   - In the **Keystore Wallet Password** field, enter the KeyStore wallet password to be used for secure communication.

18. Click **Next**.

    The Pricing Design Center System User window appears.

19. Enter the existing PDC user information.

    a. In the **User Name** field, enter the name of the PDC user that you created during the PDC 12.0 or 15.0.*x* installation.

    b. In the **Password** field, enter the password of the PDC user that you created during the PDC 12.0 or 15.0.*x* installation.

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20. Click **Next**.

    The Migration Cross-Reference Schema window appears. If you selected **Do not install Migration Utility** in step 9, proceed to step 24.

21. Enter the following information required to connect to the migration cross-reference database:

    a. In the **Host Name** field, enter the IP address or the host name of the machine on which to create the migration cross-reference database schema.

    b. In the **Port Number** field, enter the port number assigned to the migration cross-reference database service.

    > **Note**
    >
    > If the database is SSL-enabled, enter the SSL port number in the **Port Number** field.

    c. In the **User Name** field, enter the migration cross-reference database user name.

    This user should be the SYSDBA user or should have the following capabilities on the migration cross-reference database: grant create user, grant any role, grant any privileges, select any table to *username*, and grant sysdba to *username*.

    d. In the **Password** field, enter the migration cross-reference database user password.

    e. In the **Service Name** field, enter the name of the migration cross-reference database service.

    > **Note**
    >
    > Ensure that the Oracle Database server is in Running state. The Installer connects to the Oracle Database server to verify the information you entered is valid.

    f. From the **SSL** list, select the type of SSL connection required for connecting to the migration cross-reference database:

    - **No**: SSL authentication is not required.
    - **Yes-One Way**: One-way SSL authentication is required. In this case, the client must authenticate the server's identity.
    - **Yes-Two Way**: Two-way SSL authentication is required. In this case, both the client and server must authenticate each others identity.

    g. If you selected **Yes-One Way** or **Yes-Two Way**, do the following:

    - From the **Wallet Type** list, select the type of wallet to use for secure communication with the database: **SSO** or **PKCS12**.
    - In the **Truststore Wallet Location** field, enter the full path to the directory in which the database wallet is located.
    - In the **Truststore Wallet Password** field, enter the TrustStore wallet password to be used for secure communication.
    - In the **Keystore Wallet Location** field, enter the full path or browse to the directory in which the database wallet is located.

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- In the **Keystore Wallet Password** field, enter the KeyStore wallet password to be used for secure communication.

22. Click **Next**.

    The Migration User window appears.

23. Enter the migration user information.

    a. In the **User Name** field, enter the name of the migration user that you created during the PDC 12.0 or 15.0.*x* installation.

    b. In the **Password** field, enter the password of the migration user that you created during the PDC 12.0 or 15.0.*x* installation.

24. Click **Next**.

    The Installation Summary window appears.

25. Review the selections you have made in the preceding windows, and click **Install**.

    The Installation Progress window appears.

> **Note**
>
> After the installation begins, clicking **Stop installation** stops the installation process, but the files that are already copied are not removed.

26. When the installation is done, click **Next**. The Installation Complete window appears.

    Note down the provided URL, because you will need it to access PDC.

27. Click **Finish** to complete and exit.

See "Verifying the Pricing Design Center Installation" for information on verifying the successful installation of BRM Integration Pack.

See "About Installation Logs" for information on PDC Installer logs.

Upgrading PDC in Silent Mode

Use silent install mode when you are upgrading PDC using the same configuration repeatedly. Silent install mode does not use the GUI and it runs in the background.

In this mode, you use a response file template that contains a predefined set of values to upgrade PDC and BRM Integration Pack. You can generate a response file that contains the parameters and values during the PDC GUI installation.

Creating a Response File

To create a response file:

1. Create the response file by doing one of the following:

   - Create a copy of the response file that was generated during the GUI upgrade. See "Upgrading Both PDC and BRM Integration Pack" for more information.

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> **Note**
>
> The GUI Installer does not store passwords provided during installation in the response file. You must manually add the passwords after creating a copy of the response file.

- Create a response file using the template by running the following command:

  ```
  Java_home/bin/java -jar pdcserver-16.26.0.0.0_generic_full.jar -
  getResponseFileTemplates
  ```

  where *Java_home* is the directory in which you installed the latest supported Java version.

  The following response file is created with the default value: **oracle.communications.pdc.PricingDesignCenter.rsp**. Use this file template if you are installing PDC and BRM Integration Pack.

You can create as many response files as needed.

2. Open the file in a text editor.
3. Modify the response file you copied by specifying the key-value information for the parameters you want in your installation.

> **Note**
>
> - The response file template contains guidelines and examples on how to enter the values in the parameters.
> - The Installer treats incorrect context, format, and type values in a response file as if no value were specified.

4. Save and close the response file.

Upgrading PDC and BRM Integration Pack in Silent Mode

To upgrade the PDC software and BRM Integration Pack in silent mode:

1. Create the response file. See "Creating a Response File".
2. Copy the response file you created to the machine on which you run the silent installation.
3. On the machine on which you run the silent installation, go to the *temp_dir* directory to which you have downloaded the PDC server software pack, and run the following command:

   ```
   Java_home/bin/java -jar pdcserver-16.26.0.0.0_generic_full.jar -debug -invPtrLoc
   Inventory_home/oraInventory/oraInst.loc [parameter=value] -responseFile path -silent
   ```

   where:

   - *Java_home* is the directory in which you installed the latest supported Java version.
   - *parameter=value* is the name-value pair for an installation parameter, such as INSTALL_TYPE=Complete.
   - *path* is the absolute path to the response file.

   For example:

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```
Java_home/bin/java -jar pdcserver-16.26.0.0.0.0_generic_full.jar -debug -invPtrLoc
Inventory_home/oraInventory/oraInst.loc INSTALL_TYPE=Complete -responseFile /tmp/
oracle.communications.pdc.PricingDesignCenter.rsp -silent
```

The installation runs silently in the background.

See "Verifying the Pricing Design Center Installation" for information on verifying the successful installation of PDC and BRM Integration Pack.

See "About Installation Logs" for information on the PDC Installer logs.

Rolling Back an Unsuccessful Upgrade

If your upgrade is not successful, you must restore your system to the previous installation.

To restore the previous PDC installation:

1. Locate and use the WebLogic server domain for the old version of WebLogic that you used for the previous version of PDC.
2. Restore the **oraInventory** directory that you backed up before you installed the new version of PDC.
3. Restore the PDC database schema.
4. Restore the transformation cross-reference database schema.
5. Restore the migration cross-reference database schema.

Rolling Back a Successful Upgrade

After upgrading to PDC 16.26.0, you can roll back the release to the previous version if required; for example, you can roll back PDC 16.26.0 to PDC 15.0.1. To do this, you uninstall PDC 16.26.0 and reinstall PDC 15.0.1.

To roll back the PDC upgrade:

1. Ensure that you make an offline backup of the 16.26.0 database that includes the data added after the upgrade.
2. Locate the backup you made before upgrading to BRM 16.26.0. You need it to roll back the upgrade. This database is referred to as the "old database backup" in this procedure.
3. From the *PDC_home***/oui/bin** directory, undeploy PDC 16.26.0 from the WebLogic Server domain by running the following command:

   ```
   java -cp weblogic_home/wlserver/server/lib/weblogic.jar weblogic.WLST
   cleanup_weblogic_domain.py weblogic_username weblogic_host weblogic_port
   weblogic_use_ssl pdc_username
   ```

   where:

   - *weblogic_home* is the directory in which WebLogic Server is installed.
   - *weblogic_username* is the WebLogic Server domain administrator user name.
   - *weblogic_host* is the IP address or the host name of the machine on which the WebLogic Server domain is configured.
   - *weblogic_port* is the port number assigned to the WebLogic Server domain administration server.
   - *weblogic_use_ssl* is one of the following:

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  - **true** if SSL is enabled for the WebLogic Server domain.
  - **false** if SSL is disabled for the WebLogic Server domain.
- *pdc_username* is the name of the PDC user.

For example:

```
java -cp /home/usr/opt/Oracle/oracle_weblogic_14.1.2.0/wlserver/server/lib/
weblogic.jar weblogic.WLST cleanup_weblogic_domain.py weblogic example.com 1234
false pdcuser
```

Enter the *weblogic_password* when prompted by the script, where *weblogic_password* is the base-64 encoded WebLogic Server domain administrator user password.

4. In the old database backup, update the JDBC LLR table tame. See "Updating JDBC LLR Table Name".
5. Reinstall the original (older) version of PDC in a different directory. Use the installer and instructions for the oriiginal (older) PDC release. For example, use **pdcserver-12.0.0.6.0_generic_full.jar** if you are rolling back to PDC 12.0 Patch Set 6. When prompted for the PDC database, use the original database backup.
6. Log in to the PDC application and check if the components that you added after the new release installation are removed.
7. If the BRM integration Pack is installed on another system, uninstall the BRM Integration Pack on that system (optional), and install it for the original (older) version in a different directory. Use the installer and instructions for your original release. For example, use **pdcserver-12.0.0.6.0_generic_full.jar** if you are rolling back to PDC 12.0 Patch Set 6.

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8

Pricing Design Center Post-Upgrade Tasks

Learn how to perform tasks, such as creating users or synchronizing pricing setup components, after upgrading Oracle Communications Pricing Design Center (PDC).

After upgrading your existing PDC installation to PDC 16.26.0.0 or a later 16.26.0 release, do the following:

1. Upgrade your PDC database schema to the new schema. See "Upgrading the PDC Database Schema".
2. If you are using Oracle Communications Billing and Revenue Management (BRM) Elastic Charging Engine (ECE) for usage rating, upgrade to the compatible version of ECE on the machine on which ECE is installed. See "Installing Elastic Charging Engine" in *ECE Installation Guide*.

   See *BRM Compatibility Matrix* for more information about compatible versions.
3. (Optional) Restrict the tablespace quota for a schema user. The default tablespace quota is unlimited. See "Restricting Tablespace Quota for a Schema User".
4. Configure Oracle WebLogic Server to use the SSL-enabled data source. See "Configuring WebLogic Server to use SSL-Enabled Data Source".
5. Configure PDC to use the secure sockets layer (SSL)-enabled data source. See "Configuring PDC to Connect to SSL-Enabled Database".
6. (Optional) Configure Security Assertion Markup Language (SAML) to enable single sign-on (SSO) for PDC. See "Setting Up Single Sign-On for Pricing Design Center".
7. Run additional SQL scripts. See "Running the BRM Integration Pack Scripts".
8. Start the transformation engines. See "Starting the Transformation Engines".
9. Run the **SyncPDC** utility. See "Running SyncPDC".

   This synchronizes the setup components defined in other BRM components with PDC.

Upgrading the PDC Database Schema

To upgrade the PDC database schema:

1. Go to the *PDC_home***/server/upgrade/schema/pdc** directory.
2. Enter the following command, which opens SQL*Plus:

   ```
   sqlplus pdcUser@databaseName
   Enter password: password
   ```

   where:

   - *pdcUser* is the PDC database user name.
   - *password* is the PDC database user password.
   - *databaseName* is the service name or database alias of the PDC database.
3. In SQL*Plus, run the following command, which upgrades the PDC database schema:

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```
@PricingDesignCenter.sql
```

Restricting Tablespace Quota for a Schema User

PDC grants unlimited tablespace quota to the following schema users:

- PDC schema
- Transformation cross-reference schema
- Migration cross-reference schema

You can restrict the quota limit for a schema user in a tablespace by using SQL*Plus.

To restrict the tablespace quota for a schema user:

1. Connect to the PDC database using SQL*Plus with SYSDBA privileges.
2. At the SQL*Plus prompt, enter the following command:

   ```
   SQL> alter user schema_user_name  quota size on tablespace_name;
   ```

   where:

   - *schema_user_name* is the PDC schema user name.
   - *size* is the tablespace quota size.
   - *tablespace_name* is the name of the tablespace for the PDC schema user.

   For example:

   ```
   SQL> alter user schema_user_name quota 500k on data_ts;
   ```
3. Type **exit** to exit SQL*Plus.

Configuring WebLogic Server to use SSL-Enabled Data Source

To use the SSL-enabled data source in WebLogic Server:

1. Log in to WebLogic Remote Console.
2. Click **Edit Tree**, then **Services**, and then **Data Sources**.

   The available data sources are displayed.
3. For each of the following data sources, perform the following steps:
   - PricingDB
   - JobDispatcherDS
   - JobDispatcherPersistentDS

   a. Click the data source to update, then click the **Connection Pool** subtab.

   b. In the **General** tab, modify the **Url** field:

      ```
      jdbc:oracle:thin:@(DESCRIPTION=(ADDRESS=(PROTOCOL=TCPS)(HOST = hostname)(PORT = ssl-port))(CONNECT_DATA=(SERVICE_NAME=service_name)))
      ```

      where:

      - *hostname* is the name of the machine on which the database is installed.
      - *ssl-port* is the SSL-enabled port to use for connecting to the database.

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- *service_name* is the database service name used to connect to the Oracle database.

c. Click **Save**.

d. Click **Properties** under the data source you are updating in the tree in the left pane.

e. Click **New**.

f. In the **Name** field, enter:

```
javax.net.ssl.trustStore
```

g. Click **Create**.

A window that allows you to add a value to the new property appears.

h. In the **Value** field, enter the location of the client wallet that is used to connect to the database.

i. Click **Save**.

j. Click **New**.

k. In the **Name** field, enter:

```
javax.net.ssl.trustStoreType
```

l. Click **Create**.

A window that allows you to add a value to the new property appears.

m. In the **Value** field, enter the type of the client wallet, such as SSO and PKCS12. If the extension of the client wallet is **.sso**, the *wallet type* is **SSO** and if the extension of the client wallet is **.p12**, the *wallet type* is **PKCS12**.

n. Click **Save**.

o. If *wallet type* is **PKCS12**, do the following:

i. In the **Name** field, enter:

```
javax.net.ssl.trustStorePassword
```

ii. In the **Value** field, enter the wallet password.

iii. Click **Save**.

p. Click the shopping cart  at the top right, and then click **Commit Changes** to commit your changes.

q. Restart the WebLogic Server domain.

4. Log in to the PDC application.

If you cannot log in to the PDC application, verify the WebLogic Server configuration that you have performed.

Configuring PDC to Connect to SSL-Enabled Database

To connect to the SSL-enabled database securely for synchronizing, transforming, and migrating the PDC data, you must specify the SSL port number and the database TrustStore details in the following configuration files:

- **SyncPDCConfiguration.xml**
- **TransformationConfiguration.xml**

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- **MigrationConfiguration.xml**

To connect to the SSL-enabled database:

1. Open the following files, where *BRM_Integration_Pack_home* is the directory in which BRM Integration Pack is installed.
   - *BRM_Integration_Pack_home***/apps/syncpdc/SyncPDCConfiguration.xml**
   - *BRM_Integration_Pack_home***/apps/transformation/TransformationConfiguration.xml**
   - *BRM_Integration_Pack_home***/apps/migration/MigrationConfiguration.xml**
2. Uncomment the **trustStore** and **truststoreType** section to connect to the database securely:

   ```
   <dbSSLConfiguration>
           <trustStore>databaseTruststoreLocation</trustStore>
       <trustStoreType>databaseTruststoreType</trustStoreType>
   </dbSSLConfiguration>
   ```

   where:
   - *databaseTruststoreLocation* is the path to the client wallet which is used to connect to the database securely.
   - *databaseTruststoreType* is the type of the trustStore used to connect to the database securely:

     If *databaseTruststoreLocation* is **Wallet_Home/cwallet.sso**, the *databaseTruststoreType* is **SSO**.

     If *databaseTruststoreLocation* is **Wallet_Home/ewallet.p12** , the *databaseTruststoreType* is **PKCS12**.
3. Specify the SSL port number in the **connectionInfo** section for all the databases, such as the migration cross-reference database and transformation cross-reference database. For example:

   ```
   <xrefDatabase>
   <connectionInfo>
   ...
   <port>SSL_Port</port>
   ...
   </connectionInfo></xrefDatabase>
   ```
4. Save and close the file.
5. Go to the *BRM_Integration_Pack_home***/apps/bin** directory.
6. Run the following command, which updates the database TrustStore password in the BRM Integration Pack wallet:

   ```
   ./PDCBRMWalletUtil.sh walletlocation walletpassword DB_TRUSTSTORE_PASSWORD password
   ```

   where:
   - *walletlocation* is the location in which the BRM Integration Pack wallet is located.
   - *walletpassword* is the BRM Integration Pack wallet password.
   - *password* is the database TrustStore password.
7. At the command prompt, enter **Y**.

   The database **TrustStore** password is added to the BRM Integration Pack wallet.

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Running the BRM Integration Pack Scripts

Perform the following steps:

1. Go to the *BRM_Integration_Pack_home***/sqlscripts/pdc_brm** directory, where *BRM_Integration_Pack_home* is the directory in which BRM Integration Pack is installed.
2. Enter the following command, which opens SQL*Plus:

   ```
   sqlplus XrefUser@XrefDBName
   Enter password: password
   ```

   where:

   - *XrefUser* is the user name for the XREF database schema.
   - *XrefDBName* is the database alias of the XREF database.
   - *password* is the password for *XrefUser*.
3. Run the following commands:

   ```
   @AddProrateCycleXrefRRECharges.sql
   @CleanXrefDiscountMaster.sql
   @CreateXrefRRETaxCodeTable.sql
   @CreateXrefRRETaxExemptionCodeTable.sql
   @CreateXrefRRETaxSelectorTable.sql
   @CreateXrefRREPriceTagConfigTable.sql
   @AddGlidColToXREF_RRE_TAX_CODE.sql
   ```
4. Type **exit** to exit SQL*Plus.

Starting the Transformation Engines

The transformation engines do not automatically start when you start the PDC server, you must start them manually. See the discussion about starting the transformation engines in *BRM System Administrator's Guide* for more information.

Running SyncPDC

You must run the **SyncPDC** utility to synchronize the setup components defined outside of PDC.

See "Synchronizing Pricing Setup Components" in *PDC Creating Product Offerings* for more information.

If you are upgrading from PDC 12.0 Patch Set 5 or earlier, when you run SyncPDC after upgrading, changes are made to add tax code handling in PDC.

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Part IV
Setting Up SSO for PDC

This part includes instructions for setting up single sign-on (SSO) for Oracle Communications Pricing Design Center (PDC). It contains the following chapter:

- Setting Up Single Sign-On for Pricing Design Center

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Setting Up Single Sign-On for Pricing Design Center

Learn how to set up a single sign-on (SSO) login method for Oracle Communications Pricing Design Center (PDC) using SAML.

SSO allows you to log in to applications using a single user name and password combination. You set up SSO for PDC by using SAML 2.0.

You can configure SAML authentication in a PDC domain using an Oracle Access Management service provider or an Oracle Identity Cloud Service (IDCS) service provider.

To implement SSO for PDC:

1. Create a SAML authentication or identity assertion provider. See "Creating a SAML Authentication or Identity Assertion Provider".
2. Create a SAML2 web single sign-on identity provider partner. See "Creating a SAML2 Web Single Sign-On Identity Provider Partner"
3. Create a SAML authenticator. See "Creating a SAML Authenticator".
4. Configure SAML2 on the administration server. See "Configuring SAML2 on the Administration Server".
5. Generate a metadata file and publish it to all SAML identity providers. See "Publishing the Service Provider Metadata".
6. Update the PDC deployment plan. See "Updating the Deployment Plan for PDC".

Creating a SAML Authentication or Identity Assertion Provider

The SAML assertion provider validates a client's identity by mapping a client-supplied token to a user name.

To create a SAML authentication or identity assertion provider:

1. Log in to WebLogic Server Remote Console.
2. Click **Edit Tree**, then **Security**, and then **Realms**.

   The Summary of Security Realms page appears.
3. Click the **myrealm** link.

   The myrealm configuration page appears.
4. Click **Authentication Providers** in the tree in the left pane.

   A page with an Authentication Providers table appears.
5. Click **New**.

   The Create a New Authentication Provider page appears.
6. In the **Name** field, enter **samlPDC**.
7. From the **Type** list, select **SAML2IdentityAsserter**.

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8. Click **Create**.
9. Restart WebLogic Server.

Creating a SAML2 Web Single Sign-On Identity Provider Partner

To create a SAML2 web single sign-on identity provider partner:

1. Log in to WebLogic Server Remote Console.
2. Click **Security Data Tree** and then **Realms**.

   The Summary of Security Realms page appears.
3. Click the **myrealm** link.

   The myrealm configuration page appears.
4. Click **Authentication Providers** in the tree in the left pane.

   A page with an Authentication Providers table appears.
5. In the table, select **samlPDC**.

   The configuration page for samlPDC appears.
6. Click **Partners** in the tree in the left pane.
7. Click **New**.

   The Create a new Identity Provider Partner page appears.
8. In the **Name** field, enter **WebSSO-IdP-Partner-1**.
9. From the **Type** list, select **Web Single Sign-On Identity Partner**.
10. In the **Meta Data File Name** field, enter the name and the path to the XML file that contains the identity provider's metadata.
11. Click **Create**.
12. Click **WebSSO-IdP-Partner-1** in the tree in the left pane.
13. Click the **General** tab.
14. In the **General** tab, turn on **Enabled**, **Virtual User**, and **Process Attributes**.
15. In **Redirect URIs**, enter **/pdc/***.
16. Click **Save**.

Creating a SAML Authenticator

The SAML authenticator verifies the identity of users or system processes, and makes identity information available to PDC when that information is needed.

To create a SAML authenticator:

1. Log in to WebLogic Server Remote Console.
2. Click **Edit Tree**, then **Security**, and then **Realms**.

   The Summary of Security Realms page appears.
3. Click the **myrealm** link.

   The myrealm configuration page appears.
4. Click **Authentication Providers** in the tree in the left pane.

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A page with an Authentication Providers table appears.

5. Click **New**.
6. In the **Name** field, enter **samlPDCAuth**.
7. From the **Type** list, select **SAMLAuthenticator**.
8. From the **Control Flag** list, select **SUFFICIENT**.
9. Click **Create**.
10. In the Authentication Providers table, click the **DefaultAuthenticator**, and change the **Control Flag** to **SUFFICIENT**.
11. Click **Save**.
12. In the Authentication Provider table, arrange the providers in the following order using the **Move Down** and **Move Up** buttons.
    - **samlPDCAuth**
    - **samlPDC**
    - **DefaultAuthenticator**
    - **DefaultIdentityAsserter**
    - **Trust Service Identity Asserter**
13. Restart the Weblogic Server.

Configuring SAML2 on the Administration Server

To configure SAML 2.0 on the administration server:

1. Log in to WebLogic Server Remote Console.
2. Click **Edit Tree**, then **Environment**, and then **Servers**.

   The Summary of Servers page appears.
3. In the Servers table, click the administration server.

   A page containing settings for the administration server appears.
4. Click the **Security** subtab, and then the **SAML 2.0 General** subtab.
5. In the **Published Site URL** field, enter **http://***pdc_hostname:port***/saml2**.

   where:
   - *pdc_hostname* is the PDC application host.
   - *port* is the port on which PDC is listening on.
6. In the **Entity ID** field, enter **samlPDC**.
7. Click **Save**.
8. Click the **SAML 2.0 Service Provider** subtab.
9. Turn on **Enabled**.
10. Turn on **POST Binding Enabled**.
11. From the **Preferred Binding** list, select **HTTP/POST**.
12. In the **Default URL** field, enter **http://***pdc_hostname:port***/pdc/faces/oracle/communications/brm/pdc/ui/pages/login.jspx**.

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where:

- *pdc_hostname* is the PDC application host.
- *port* is the port on which PDC is listening on.

13. Click **Save**.
14. Restart WebLogic Server.

Publishing the Service Provider Metadata

To publish the service provider metadata:

1. Log in to WebLogic Server Remote Console.
2. Click **Monitoring Tree**, then **Environment**, and then **Servers**.

   The Summary of Servers page appears.
3. In the Servers table, click the administration server.

   A page containing settings for the administration server appears.
4. Click **SAML 2.0** subtab.
5. Click **Publish metadata**.
6. In the **File Name** field, enter the full path and the name of the file.
7. Click **Done**.

Updating the Deployment Plan for PDC

To update your deployment plan for PDC:

1. Create a new **plan.xml** file with the PDC deployment plan, or edit your existing **plan.xml** file.
2. In the file, add a **logoutURL** variable set to your identity provider (IDP) logout URL:

```
<variable-definition>
   <variable>
      <name>logoutUrl</name>
      <value>IDP_LOGOUT_URL</value>
   </variable>
</variable-definition>
```

3. Add the following **module-override** element:

```
<module-override>
   <module-name>BPA.war</module-name>
   <module-type>war</module-type>
   <module-descriptor external="false">
      <root-element>web-app</root-element>
      <uri>WEB-INF/web.xml</uri>
      <variable-assignment>
         <name>logoutUrl</name>
         <xpath>/web-app/context-param/[param-name="loginURL"]/param-
value</xpath>
         <operation>replace</operation>
```


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```
        </variable-assignment>
      </module-descriptor>
    </module-override>
```

4. Save and close your **plan.xml** file.
5. Redeploy the PDC application with your new **plan.xml** file.

For more information about updating and deploying your deployment plan, see the "Create and Use a Deployment Plan in Oracle WebLogic Server" tutorial.

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Part V

Verifying Pricing Design Center

This part includes instructions for verifying your installation of Oracle Communications Pricing Design Center (PDC). It contains the following chapter:

- Verifying the Pricing Design Center Installation

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Verifying the Pricing Design Center Installation

Learn how to verify that your Oracle Communications Pricing Design Center (PDC) software was installed or upgraded correctly.

Topics in this document:

- Verifying the PDC Installation
- Verifying the BRM Integration Pack Installation
- Verifying the PDC REST Services Manager Installation

Verifying the PDC Installation

You can verify that PDC is installed successfully by checking the state of all installed components or by logging in to PDC.

To check the state of all installed components:

1. Log in to WebLogic Server Remote Console for the domain in which PDC is deployed.
2. Click **Monitoring Tree**, then **Environment**, and then **Servers**.

   The Servers page appears.
3. In the **State** column, verify that the managed servers on which PDC is deployed are in the **RUNNING** state.
4. Click **Monitoring Tree**, then **Deployments**, and then **Application Management**.

   A page listing the deployed applications appears.
5. In the **Application Management** table, locate the following applications and verify that each application is in the **Active** state in the **State** column:
   - **JobDispatcher**
   - **PricingDesignCenter**

To log in to PDC:

1. Open a browser window.
2. Enter the URL provided at the end of the installation.

   > **Note**
   >
   > You can also get the URL for accessing PDC from the *PDC_home***/install/readme.txt** file, where *PDC_home* is the directory in which you installed PDC.
3. Press Enter.

   The PDC login page appears.
4. Enter your user name and password.

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The PDC home page appears, verifying that PDC is installed successfully.

You can also verify the PDC installation by checking the version number in the *PDC_home*/**apps/bin/VERSION** file.

Verifying the BRM Integration Pack Installation

By default, the installer stores sensitive information, such as account and database passwords, in the wallet, and it stores other configuration values in the respective configuration files.

You can verify that BRM Integration Pack is installed successfully by checking that the values entered during the PDC BRM Integration Pack installation are stored in the following configuration files:

- *BRM_Integration_Pack_home*/**apps/syncpdc/SyncPDCConfiguration.xml**
- *BRM_Integration_Pack_home*/**apps/transformation/TransformationConfiguration.xml**
- (If you installed the migration utility) *BRM_Integration_Pack_home*/**apps/migration/MigrationConfiguration.xml**

where *BRM_Integration_Pack_home* is the directory in which you installed BRM Integration Pack.

You can also verify the BRM Integration Pack installation by checking the version number in the *BRM_Integration_Pack_home*/**apps/bin/VERSION** file.

Verifying the PDC REST Services Manager Installation

You can verify that PDC REST Services Manager is installed successfully by checking its configuration files, starting the service, and confirming that it responds to REST API requests.

To verify the PDC REST Services Manager installation:

1. Verify that the values entered during installation are stored in the following configuration files:
   - *PDC_RSM_home*/**apps/conf/application.yaml**
   - *PDC_RSM_home*/**apps/conf/meta-config.yaml**

   where *PDC_RSM_home* is the directory in which you installed PDC REST Services Manager.
2. Verify the PDC REST Services Manager version number in the *PDC_RSM_home*/**apps/bin/VERSION** file.
3. Before starting PDC REST Services Manager for the first time, ensure that you have configured a unique AES master password and loaded it into the RSM process environment. See "Configuring the PDC REST Services Manager AES Master Password".
4. As the RSM operating-system user, go to the *PDC_RSM_home*/**apps/bin** directory and start PDC REST Services Manager:

   ```
   cd "$PDC_RSM_home/apps/bin"
   ./RestServicesManager.sh start
   ```

   Check the status of PDC REST Services Manager:

   ```
   ./RestServicesManager.sh status
   ```

   Verify that the status indicates that PDC REST Services Manager is running.

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5. After configuring API authentication, obtain a valid OAuth access token for PDC REST Services Manager. Ensure that the TOKEN environment variable contains the access token. See "Securing PDC REST Services Manager Communications" in *PDC REST Services Manager Integration Guide* for more information.
6. Verify that PDC REST Services Manager responds to API requests by running the following command:

   ```
   curl -i \
     -H "Authorization: Bearer $TOKEN" \
     -H "Accept: application/json" \
     "http://hostname:port/productCatalogManagement/v4/productOffering"
   ```

   If TLS is enabled, use HTTPS and validate the server certificate:

   ```
   curl -i --cacert "/path/to/trusted-certificate.pem" \
     -H "Authorization: Bearer $TOKEN" \
     -H "Accept: application/json" \
     "https://hostname:port/productCatalogManagement/v4/productOffering"
   ```

   where:

   - *hostname* is the host name of the machine on which PDC REST Services Manager is running.
   - *port* is the port number configured for PDC REST Services Manager to receive API requests.
   - TOKEN is a valid OAuth access token authorized to access the API.
   - **/path/to/trusted-certificate.pem** is the path to the trusted CA certificate or the verified self-signed RSM server certificate.

   The expected response is HTTP status code 200 OK and a JSON array containing product offerings. The array can be empty if no matching product offerings exist. When TLS is enabled, verify that the HTTPS request succeeds without certificate validation errors.
7. If PDC REST Services Manager does not start or the request fails, check the log files in the *PDC_RSM_home***/apps/log** directory for errors.

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Part VI

Uninstalling Pricing Design Center

This part includes instructions for uninstalling the Oracle Communications Pricing Design Center (PDC) software. It contains the following chapter:

- Uninstalling Pricing Design Center

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Uninstalling Pricing Design Center

Learn how to uninstall the following Oracle Communications Pricing Design Center (PDC) components from your system: the PDC software, Oracle Communications Billing and Revenue Management (BRM) Integration Pack, and PDC REST Services Manager.

Topics in this document:

- Uninstalling PDC in GUI Mode
- Uninstalling BRM Integration Pack in GUI Mode
- Uninstalling PDC REST Services Manager in GUI Mode
- Uninstalling PDC Using Silent Mode
- Uninstalling BRM Integration Pack in Silent Mode
- Uninstalling PDC REST Services Manager in Silent Mode

Uninstalling PDC in GUI Mode

You can use Oracle Universal Installer to uninstall PDC and its components, such as BRM Integration Pack.

> **Note**
>
> Oracle Universal Installer does not uninstall an upgrade. You can restore the previous release installation by replacing the new directories using the backup copy of your previous release installation. See "Rolling Back an Unsuccessful Upgrade" for more information about restoring the environment after an upgrade to a new release, or see "Rolling Back a Successful Upgrade" for more information about restoring the environment after the installation of a new release.

To uninstall PDC:

1. Go to the *PDC_home***/oui/bin** directory, where *PDC_home* is the directory in which you installed PDC.
2. Clean up the WebLogic Server domain by running the following command:

   ```
   java -cp weblogic_home/wlserver/server/lib/weblogic.jar weblogic.WLST
   cleanup_weblogic_domain.py weblogic_username weblogic_host weblogic_port
   weblogic_use_ssl pdc_username
   ```

   where:

   - *weblogic_home* is the directory in which WebLogic Server is installed.
   - *weblogic_username* is the WebLogic Server domain administrator user name.
   - *weblogic_host* is the IP address or the host name of the machine on which the WebLogic Server domain is configured.

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- *weblogic_port* is the port number assigned to the WebLogic Server domain administration server.
- *weblogic_use_ssl* is one of the following:
  - **true** if SSL is enabled for the WebLogic Server domain.
  - **false** if SSL is disabled for the WebLogic Server domain.
- *pdc_username* is the name of the PDC user.

For example:

```
java -cp /home/usr/opt/Oracle/oracle_weblogic_14.1.2.0/wlserver/server/lib/
weblogic.jar weblogic.WLST cleanup_weblogic_domain.py weblogic example.com 1234
false pdcuser
```

Enter the *weblogic_password* when prompted by the script, where *weblogic_password* is the base-64 encoded WebLogic Server domain administrator user password.

3. Run the following command:

   ```
   ./deinstall.sh
   ```

   The Distribution to Uninstall window appears.
4. Select the components you want to uninstall.
5. Click **Uninstall**.

   The Welcome window appears.
6. Click **Next**.

   The Uninstallation Summary window appears.
7. Click **Uninstall**.

   The Uninstallation Progress window appears.
8. Click **Next**.

   The Uninstallation Complete window appears.
9. Click **Finish**.

The Installer removes all of the files except the log files. You must delete the log files manually.

You can check the log files in the **oraInventory/logs** directory. The default location of the **oraInventory** directory is in the **/etc/oraInst.loc** file.

Uninstalling BRM Integration Pack in GUI Mode

To uninstall BRM Integration Pack using Oracle Universal Installer:

> **Note**
>
> Oracle Universal Installer does not uninstall an upgrade. You can restore the previous release installation by replacing the new directories using the backup copy of your previous release installation. See "Rolling Back an Unsuccessful Upgrade" for more information about restoring the environment after an upgrade to a new release, or see "Rolling Back a Successful Upgrade" for more information about restoring the environment after the installation of a new release.

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1. Go to the *BRM_Integration_Pack_home***/oui/bin** directory, where *BRM_Integration_Pack_home* is the directory in which you installed the BRM Integration Pack.
2. Run the following command:

   ```
   ./deinstall.sh
   ```

   The Distribution to Uninstall window appears.
3. Select the components you want to uninstall.
4. Click **Uninstall**.

   The Welcome window appears.
5. Click **Next**.

   The Uninstallation Summary window appears.
6. Click **Uninstall**.

   The Uninstallation Progress window appears.
7. Click **Next**.

   The Uninstallation Complete window appears.
8. Click **Finish**.

The Installer removes all of the files except the log files. You must delete the log files manually.

You can check the log files in the **oraInventory/logs** directory. The default location of the **oraInventory** directory is in the **/etc/oraInst.loc** file.

Uninstalling PDC REST Services Manager in GUI Mode

To uninstall PDC REST Services Manager using Oracle Universal Installer:

1. Go to the *PDC_RSM_home***/oui/bin** directory, where *PDC_RSM_home* is the directory in which you installed PDC REST Services Manager.
2. Run the following command:

   ```
   ./deinstall.sh
   ```

   The Distribution to Uninstall window appears.
3. Select the components you want to uninstall.
4. Click **Uninstall**.

   The Welcome window appears.
5. Click **Next**.

   The Uninstallation Summary window appears.
6. Click **Uninstall**.

   The Uninstallation Progress window appears.
7. Click **Next**.

   The Uninstallation Complete window appears.
8. Click **Finish**.

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The Installer removes all of the files except the log and the configuration files. The configuration files are renamed with additional information like date and time of uninstallation. You must delete these files manually.

You can check the log files in the **oraInventory/logs** directory. The default location of the **oraInventory** directory is in the **/etc/oraInst.loc** file.

Uninstalling PDC Using Silent Mode

To uninstall PDC using silent mode:

1. Go to the *PDC_home***/oui/bin** directory.
2. Clean up the WebLogic Server domain by running the following command:

   ```
   java -cp weblogic_home/wlserver/server/lib/weblogic.jar weblogic.WLST
   cleanup_weblogic_domain.py weblogic_username weblogic_host weblogic_port
   weblogic_use_ssl pdc_username
   ```

   where:

   - *weblogic_home* is the directory in which WebLogic Server is installed.
   - *weblogic_username* is the WebLogic Server domain administrator user name.
   - *weblogic_host* is the IP address or the host name of the machine on which the WebLogic Server domain is configured.
   - *weblogic_port* is the port number assigned to the WebLogic Server domain administration server.
   - *weblogic_use_ssl* is one of the following:
     - **true** if SSL is enabled for the WebLogic Server domain.
     - **false** if SSL is disabled for the WebLogic Server domain.
   - *pdc_username* is the name of the PDC user.

   For example:

   ```
   java -cp /home/usr/opt/Oracle/oracle_weblogic_14.1.2.0/wlserver/server/lib/
   weblogic.jar weblogic.WLST cleanup_weblogic_domain.py weblogic example.com 1234
   false pdcuser
   ```

   Enter the *weblogic_password* when prompted by the script, where *weblogic_password* is the base-64 encoded WebLogic Server domain administrator user password.
3. Run the following command:

   ```
   ./deinstall.sh -silent -responseFile path
   ```

   where *path* is the location of the response file that you created during the GUI installation of PDC.

   A message is displayed indicating that PDC has been uninstalled successfully.

Uninstalling BRM Integration Pack in Silent Mode

To uninstall BRM Integration Pack in silent mode:

1. Go to the *BRM_Integration_Pack_home***/oui/bin** directory.
2. Run the following command:

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```
./deinstall.sh -silent -responseFile path
```

where *path* is the location of the response file that you created during the GUI installation of BRM Integration Pack.

A message is displayed indicating that BRM Integration Pack has been uninstalled successfully.

Uninstalling PDC REST Services Manager in Silent Mode

To uninstall PDC REST Services Manager in silent mode:

1. Go to the *PDC_RSM_home***/oui/bin** directory.
2. Run the following command:

   ```
   ./deinstall.sh -silent -responseFile path
   ```

   where *path* is the location of the response file that you created during the GUI installation of PDC REST Services Manager.

   A message is displayed indicating that PDC REST Services Manager has been uninstalled successfully.

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