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Preface

This guide describes the system requirements and procedures for installing Oracle Communications Billing and Revenue Management Elastic Charging Engine (ECE) 12.0.

Audience

This document is for system administrators who install and configure the ECE software and those involved in planning a charging system that includes ECE. The person installing the software should be familiar with the following topics:

■ Operating system commands
■ Database configuration
■ Network management
■ Oracle Coherence

Before reading this guide, you should have a familiarity with ECE. See BRM Concepts.

Documentation Accessibility

For information about Oracle's commitment to accessibility, visit the Oracle Accessibility Program website at http://www.oracle.com/pls/topic/lookup?ctx=acc&id=docacc.

Access to Oracle Support

Oracle customers that have purchased support have access to electronic support through My Oracle Support. For information, visit http://www.oracle.com/pls/topic/lookup?ctx=acc&id=info or visit http://www.oracle.com/pls/topic/lookup?ctx=acc&id=trs if you are hearing impaired.

Accessing Oracle Communications Documentation

ECE documentation and additional Oracle documentation; such as Oracle Database documentation, is available from Oracle Help Center:

■ http://docs.oracle.com

Additional Oracle Communications documentation is available from the Oracle software delivery Web site:

■ https://edelivery.oracle.com
This chapter provides an overview of Oracle Communications Billing and Revenue Management Elastic Charging Engine (ECE) 12.0 installed components and of the ECE installation process.

See the discussion about system architecture in *BRM Concepts* for information about ECE components.

**About Installing ECE**

When you install ECE, you are given the option to install individual ECE software components or to install all ECE software components at once. The components you choose to install depends on what you want to do with ECE. For a development system, you typically install the ECE Server component only.

**Overview of ECE Installed Components**

The installed components depend on whether you perform an ECE development installation or perform an ECE production installation.

**Installed Components in an ECE Standalone Installation**

For an ECE development installation, you install and configure the following components:

- Third-party software, such as Groovy
  
  Groovy is a prerequisite for running the ECE installer. Groovy is also used for launching the Elastic Charging Controller (ECC), which is the ECE command line interface.

- Java Runtime Environment (JRE) from Java Development Kit (JDK), if it is not already installed

- ECE Server software
  
  ECE Server software includes the core processes required for receiving and processing requests, responding to systems that send requests, and publishing rated event data.

**Installed Components in an ECE Integrated Installation**

For an ECE production installation, you install and configure the following components:

- Third-party software, such as Groovy
Groovy is a prerequisite for running the ECE installer. Groovy is also used for launching the Elastic Charging Controller (ECC), which is the ECE command line interface.

- Java Runtime Environment (JRE) from Java Development Kit (JDK), if it is not already installed
- The following products required in a production system, if they are not already installed:
  - PDC
    PDC requires that you also install Oracle WebLogic Server
    Oracle WebLogic Server is not part of the core ECE installation, but it is used by ECE when ECE is implemented in a production charging solution.
  - Oracle Database to persist the data in the database or Oracle NoSQL Database to persist the data in the cache
  - BRM server
  - Online or offline network mediation software
    Network mediation software is required for sending requests to ECE in a production charging solution. The ECE installation process does not have a dependency on network mediation software. The network mediation software is installed after ECE is installed since it is a client of ECE.
- The following ECE software components, which you install by running the ECE installer:
  - ECE Server software
    ECE Server software includes the core processes required for receiving and processing requests, responding to systems that send requests, and publishing rated event data.
  - ECE BRM Integration Pack
  - ECE PDC Integration Pack

Overview of the ECE Installation Procedure

The installation procedure follows these steps:

1. Plan your installation. When planning your installation, you do the following:
   - Determine the scale of your implementation, for example, a small test system or a large production system.
   - Determine how many physical machines you need, and which software components to install on each machine.
   - Plan the system topology, for example, how the system components connect to each other over the network.

2. Review system requirements. System requirements include:
   - Hardware requirements, such as disk space
   - System software requirements, such as operating system (OS) versions and OS patch requirements, and JVM process requirements (such as memory settings)
   - Information requirements, such as IP addresses and host names
3. Perform pre-installation tasks.

4. If you are installing an ECE production installation:
   - Ensure you have installed and configured the following products:
     - BRM
     - PDC
     - Oracle Database or Oracle NoSQL Database (based on your persistence requirement)
   - Set up a JMS queue for ECE notification events
   - Create the required Oracle Advanced Queueing (AQ) database queues (DBMS AQs) for BRM update requests

5. Install ECE.
   You may need to run the ECE installation multiple times. For example, when performing an ECE production installation, you run the installer to install all ECE software components, and then run the installer again to install the ECE Server component so that you can run Rated Event Formatter on a separate machine.

   If you are installing an ECE production installation, create required queues for ECE acknowledgment events (Acknowledgments Queue), and failed customer data updates (Suspense Queue)

7. Verify the installation.

8. If you are installing an ECE production installation, install and configure your network mediation software, such as Oracle Communications Offline Mediation Controller.

---

Overview of the ECE Installation Procedure for Upgrade

**Important:** A direct upgrade from an existing ECE release is not supported.

If you have an existing ECE installation (earlier release installation), and you are installing ECE 12.0, you need to follow these steps:

1. Plan your installation.
2. Review system requirements.
3. Back up your existing configuration.
   Back up all files of the existing ECE installation on the driver machine.
4. Create a new directory for the new installation on the driver machine.
5. Upgrade system requirements that are required by the new release:
   - Install the required version of JRE/JDK.
   - Do one of the following:
     - If you want to store all the ECE data in the database, use Oracle Database. You can use the BRM database to persist the ECE data.
If you want to continue to persist only the rated events in Oracle NoSQL database, install the required version of Oracle NoSQL Database.

- Verify that you have installed the required version of Oracle WebLogic Server.
  Installing Oracle WebLogic Server is a pre-requisite for PDC so this is the version that PDC requires.
- Install the required version of BRM.
- Install the required version of PDC.
- Upgrade your network mediation software.

6. Install ECE.

You install ECE in the new directory on the driver machine.

7. Perform the following post-installation tasks:
   - Merge configurations from the existing installation into the new installation.
   - Upgrade extension code.
   - Update BRM configuration files.
   - Deploy the new ECE installation onto server machines.
   - Stop the ECE nodes of your existing installation.
   - Restore your ECE system by reloading data from BRM and PDC.
   - Start all ECE nodes of the new installation.

8. Verify the installation.

ECE Installation Options

You can install ECE in two ways:

- **GUI installation**: Use the GUI installation when you want to interact with the installer GUI during installation.

- **Silent installation**: The silent installation enables you to perform a non-interactive installation of ECE. The silent installer uses a response file that contains the installation parameters and values. Use the silent installation when you are repeatedly installing ECE using the same configuration. Silent installation is a way of setting installation configurations only once and then using those configurations to duplicate the installation on many machines.

  The silent installer runs in the background without requiring any user intervention. To obtain the silent installation response file, you run the GUI installation using the record option for the first install. The GUI installer creates a response file with the parameters and values that you specify during the installation. You can then copy and edit the response file to reflect the specifics of your target system, and to contain your preferred installation options.

Ensuring a Successful ECE Installation

The ECE installation should be performed only by qualified personnel. You must be familiar with your operating system.

Follow these guidelines:
As you install each component (for example, Groovy and JDK), verify that the component installed successfully before continuing the installation process.

Pay close attention to the system requirements. Before you begin installing the software, make sure your system has the required base software. In addition, make sure that you know all of the required configuration values, such as host names and port numbers.

As you create new configuration values, write them down. In some cases, you need to re-enter configuration values later in the procedure.

Directory Placeholders Used in This Guide

Table 1–1 shows the placeholders that are used in this guide to refer to the directories that contain ECE system components.

<table>
<thead>
<tr>
<th>Placeholder</th>
<th>Directory</th>
</tr>
</thead>
<tbody>
<tr>
<td>$ECE_home$</td>
<td>The directory in which ECE is installed. This directory contains the ECE Server software directory ($ECE_home$) and the SDK directory ($ECE_home$/ocecesdk) and various installation-related files.</td>
</tr>
</tbody>
</table>
Planning Your ECE Installation

This chapter provides information about planning your Oracle Communications Billing and Revenue Management Elastic Charging Engine (ECE) 12.0 installation.

About Planning Your ECE Installation

When planning an ECE installation, you consider how many physical servers can handle your subscriber base and how many charging server nodes to include in your cluster. You decide what server to use as the primary administrator machine, referred to as the *driver machine*, and what ECE components to install on the other servers, referred to as *server machines*. You also consider security aspects of your system and how it communicates with other applications in your charging system, such as Oracle Communications Billing and Revenue Management (BRM) and Oracle Communications Offline Mediation Controller.

System Deployment Planning

When planning an ECE installation, you consider how many charging server nodes to include in your cluster. If you use Diameter Gateway as your network integration for online charging, you also consider how many Diameter Gateway nodes to include in your cluster.

When considering how many charging server nodes and Diameter Gateway nodes to include in your cluster, note the following points:

- You will want to determine the minimum number of charging server nodes needed for your customer base. If the minimum number is \( N \), you need to run at least \( n+1 \) nodes to have uninterrupted usage processing during a rolling upgrade.

- In an ECE distributed environment (multiple machines), the guideline is to have a minimum of two charging server nodes per machine (provided the total number of charging server nodes can handle the normal expected throughput for your system). The minimum configuration for Diameter Gateway nodes is 2 to allow for failover plus additional nodes as needed to handle the expected throughput of the system.

- For a standalone installation (single machine) for a design or test environment, note the following guidelines:
  - Although you can use one charging server node in a design or test environment, having only one charging server node is not a valid configuration for deploying into a runtime environment.
  - The minimum configuration for an ECE standalone installation is 3 charging server nodes, which accounts for two charging server nodes plus an additional
node if both charging server nodes fail. The minimum configuration for an ECE standalone installation for Diameter Gateway nodes is 2 to allow for failover.

- Server redundancy is a minimum requirement of ECE installations.

**Coherence Planning**

ECE nodes are based on Oracle Coherence. Decide how to configure Oracle Coherence settings for your ECE topology. For example, how many nodes to add to the cluster when a node failure occurs. See the discussion in the Oracle Coherence documentation for information about Oracle Coherence high availability and performance concepts.

**About Installing a Secure System**

In a production system, you must ensure that communication between components and access to the system servers are secure. When you install ECE, you will be prompted to select security options during the installer process. After you install ECE, you can enable SSL communication between ECE and BRM.
ECE System Requirements

This chapter describes the software, hardware, and information requirements for Oracle Communications Billing and Revenue Management Elastic Charging Engine (ECE) 12.0.

Software Requirements

For information on the supported and required software, see BRM Compatibility Matrix.

Hardware Requirements

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

For a standalone system, ECE requires:

- 4 GB of RAM (or more)
- 200 MB of disk space (or more)
- 2 x86 cores (or more)

About Oracle Exadata

ECE is supported on Oracle Exadata (Extreme Flash Storage) systems. You can use an Oracle Exadata or non-Exadata database for creating the ECE schema. The Oracle database must be installed and configured with Oracle RAC. See the Oracle Exadata documentation for more information on Extreme Flash Storage server and how to create an Oracle RAC instance in Oracle Exadata.

Information Requirements

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

Note: Oracle recommends that you print the tables in this section and record the values for future reference.
**Information Requirements for Development and Production Installations**

This section describes the information requirements common to both an ECE development installation and an ECE production installation.

In each section that follows, you can use the **Value** column of the tables to note the values of the fields for your specific installation.

**Required Information for Machines in the Coherence Cluster**

**Table 3–1** lists the information requirements for the machines in the Coherence cluster.

<table>
<thead>
<tr>
<th>Information Type</th>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>User name</td>
<td>The user name for all machines in the cluster. You will create this user and specify the user name as a pre-installation task. All machines are required to have the same user name. <strong>Tip</strong>: Along with same user name, all the servers must also allow password-less SSH login for the driver machine user.</td>
<td>-</td>
</tr>
<tr>
<td>Host names or IP addresses</td>
<td>The names or the IP addresses of all host machines on which ECE nodes will reside. This information is required only if you select to enable security-related configurations during the installation (security enabled with or without SSL). Include your computer name in this entry. Do not enter localhost or a loopback address.</td>
<td>-</td>
</tr>
<tr>
<td>IP address range</td>
<td>If you have multiple hosts in the same subnet, note the from and to IP addresses for the range of hosts in the same subnet. This information is required only if you select to enable security-related configurations during the installation (security enabled with or without SSL).</td>
<td>-</td>
</tr>
<tr>
<td>Administrator alias name</td>
<td>The alias name that defines the administrator for securing the Coherence cluster. You define this value during installation. This value is required only if you select to enable SSL and security-related configurations during the installation. This value cannot be changed after it is set.</td>
<td>-</td>
</tr>
<tr>
<td>Administrator alias password</td>
<td>The password for the administrator alias. You define this value during installation. This value is required only if you select to enable SSL and security-related configurations during the installation. This value cannot be changed after it is set.</td>
<td>-</td>
</tr>
<tr>
<td>Directory location of JAR files</td>
<td>The directory on the driver machine (the primary administrator machine) where required JAR files are to be stored. You will copy the JAR files to this directory as a pre-installation task.</td>
<td>-</td>
</tr>
</tbody>
</table>
Persistence Database Information
You must use Oracle Database to enable persistence of all the ECE data.

Table 3–2 lists the persistence database information required during the ECE installation.

Note: You can use the BRM database for creating the ECE schema.

Table 3–2 Persistence Database Information

<table>
<thead>
<tr>
<th>Information Type</th>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Host Name</td>
<td>The IP address or the host name of the machine on which the ECE persistence database is installed.</td>
<td>-</td>
</tr>
<tr>
<td>Port Number</td>
<td>The non-SSL port number assigned to the Oracle Database service.</td>
<td>-</td>
</tr>
<tr>
<td>User Name</td>
<td>The name of the SYSDBA system user.</td>
<td>-</td>
</tr>
<tr>
<td>Password</td>
<td>The ECE persistence database user password.</td>
<td>-</td>
</tr>
<tr>
<td>Service Name</td>
<td>The name of the Oracle Database service.</td>
<td>-</td>
</tr>
</tbody>
</table>

Persistence Schema Information
Table 3–2 lists the persistence schema information required during the ECE installation.

Note: You can use an existing schema for ECE persistence or create a new schema user during the ECE installation.

Table 3–3 Persistence Schema Information

<table>
<thead>
<tr>
<th>Information Type</th>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>User Name</td>
<td>The name of the existing ECE persistence schema user.</td>
<td>-</td>
</tr>
<tr>
<td>Password</td>
<td>The password of the existing ECE persistence schema user.</td>
<td>-</td>
</tr>
<tr>
<td>Host Name</td>
<td>The IP address or the host name of the machine on which the ECE persistence database is installed.</td>
<td>-</td>
</tr>
<tr>
<td>Port Number</td>
<td>The non-SSL port number assigned to the Oracle Database service.</td>
<td>-</td>
</tr>
<tr>
<td>Driver</td>
<td>The driver machine used to connect to the ECE persistence database.</td>
<td>-</td>
</tr>
<tr>
<td>Service Name</td>
<td>The name of the Oracle Database service.</td>
<td>-</td>
</tr>
</tbody>
</table>

Oracle NoSQL Database Information
Table 3–4 lists the Oracle NoSQL database information required during the ECE installation.
Keystore Credentials Information

ECE uses the server.jks file for enabling Secure Socket Layer (SSL) and stores cipher keys used for keeping the Coherence cluster secure.

The following is the keystore credentials information you need to provide during the ECE installation.

- The key password ECE uses for accessing the files.
- The certificate store password used for accessing the server.jks file.
- The authorization of users for what they can do regarding cluster security. You set this value in the DName field during installation.

The DName (acronym for Distinguished Name) is similar to a group in UNIX.

Some examples are:

\[CN=Administrator,OU=Rating,O=CompanyB\]

or
\[CN=Developer,OU=ECE\]

where:
- \(CN\) is the common name for the user.
- \(OU\) is the organizational unit of the user.
- \(O\) is the organization of the user.

Third-Party Library Information

During the installation, you need to specify the directory where you saved the JAR files required for the ECE installation process.

For more information, see "Obtaining Required JAR Files".

Additional Information Requirements for an ECE Production Installation

This section describes the additional information requirements for an ECE production installation.
**WebLogic Server Information**

You install WebLogic Server when you install PDC. You set up two JMS queues on a WebLogic server:

- A pricing data JMS queue that ECE listens on to consume pricing data that PDC publishes into the queue.
- A notification event queue (JMS topic) into which ECE publishes notification events that external systems, such as network mediation programs, can consume to obtain data for their own processing.

---

**Note:** ECE provides a post-installation script that will create the notification event queue for you.

---

Table 3–5 lists the WebLogic Server information that is required during the ECE installation.

<table>
<thead>
<tr>
<th>Information Type</th>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Host name</td>
<td>The host name of the server on which the JMS queues reside.</td>
<td>-</td>
</tr>
<tr>
<td>Port number</td>
<td>The port number of the server on which the JMS queues reside.</td>
<td>-</td>
</tr>
<tr>
<td>User name</td>
<td>The user name for logging in to the WebLogic server on which the JMS queues reside.</td>
<td>-</td>
</tr>
<tr>
<td>Password</td>
<td>The password for logging in to the WebLogic server on which the JMS queues reside.</td>
<td>-</td>
</tr>
<tr>
<td>Module name</td>
<td>The JMS system module name on the WebLogic server on which the JMS queues reside.</td>
<td>-</td>
</tr>
<tr>
<td>Subdeployment</td>
<td>The name of the subdeployment target in the JMS system module.</td>
<td>-</td>
</tr>
<tr>
<td>Connection Factory name</td>
<td>The connection factory name that is used to create connections to the JMS topic queue on the WebLogic Server to which ECE will publish notification events. After you install ECE, you will run an ECE post-installation script that will create the JMS topic queue on the WebLogic Server. The connection factory name is used by the script to create the connections to the JMS topic queue.</td>
<td>-</td>
</tr>
<tr>
<td>Topic Name</td>
<td>The JMS topic queue name of the JMS topic on the WebLogic Server to which ECE will publish notification events. After you install ECE, you will run a post-installation script that will create the JMS topic on the WebLogic Server. The topic name is the name the ECE post-installation script will use to create the JMS topic.</td>
<td>-</td>
</tr>
</tbody>
</table>

---

**BRM Information**

Table 3–6 lists the BRM information required during the ECE installation.
Table 3–6  BRM Information

<table>
<thead>
<tr>
<th>Information type</th>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>BRM user name</td>
<td>The user name for logging in to BRM.</td>
<td>-</td>
</tr>
<tr>
<td>BRM password</td>
<td>The password for logging in to BRM.</td>
<td>-</td>
</tr>
<tr>
<td>Database host name</td>
<td>The IP address or the host name of the computer on which the BRM database is configured.</td>
<td>-</td>
</tr>
<tr>
<td>Database port number</td>
<td>The port number assigned to the BRM database service.</td>
<td>-</td>
</tr>
<tr>
<td>Service name</td>
<td>The name of the BRM database service.</td>
<td>-</td>
</tr>
<tr>
<td>Database user name</td>
<td>The BRM database schema user name.</td>
<td>-</td>
</tr>
<tr>
<td>Database password</td>
<td>The password for the BRM database user.</td>
<td>-</td>
</tr>
<tr>
<td>Queue name</td>
<td>The name of the database queue that the BRM Oracle DM uses to publish business events for ECE to consume.</td>
<td>-</td>
</tr>
<tr>
<td>Suspense queue name</td>
<td>The name of the database queue that ECE uses to move failed failed customer data updates so they can be retried later. An ECE post-installation script will create the queue itself. You only need to supply the name you want to use for the queue.</td>
<td>-</td>
</tr>
<tr>
<td>Acknowledgement queue name</td>
<td>The name of the database queue that ECE will use to publish acknowledgement events for BRM to consume (used for rerating). An ECE post-installation script will create the queue itself. You only need to supply the name you want to use for the queue.</td>
<td>-</td>
</tr>
<tr>
<td>CM host name</td>
<td>The IP address or the host name of the computer on which BRM Connection Manager (CM) is configured.</td>
<td>-</td>
</tr>
<tr>
<td>CM port number</td>
<td>The port number for CM.</td>
<td>-</td>
</tr>
</tbody>
</table>

External Manager Gateway Information

Table 3–7 lists the External Manager (EM) Gateway information required during the ECE installation.

If convenient, you can use the **Value** column of the table to note the values of the fields for your specific installation so that you have it available when you run the ECE installer.
During the installation, you must specify the system connection information of the server on which the JMS queue for PDC pricing component data resides. PDC publishes pricing component data into this queue. ECE listens on this JMS queue to consume the pricing component data.

### Table 3–7  External Manager Gateway Information

<table>
<thead>
<tr>
<th>Information type</th>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Starting Port Number</td>
<td>The port number assigned to EM Gateway. If you have more than one EM Gateway instance, this is the starting port number. Subsequent port numbers increase by one for each additional EM Gateway instance. For example, if the starting port number is <strong>15502</strong> and you specify three EM Gateway instances, ports <strong>15502</strong>, <strong>15503</strong>, and <strong>15504</strong> are used by EM Gateway processes. Ensure that no other processes on the machine use port numbers assigned to EM Gateway instances.</td>
<td>-</td>
</tr>
<tr>
<td>Wallet File Absolute Path</td>
<td>The default path to the Oracle wallet file containing the SSL trusted certificates for EM Gateway: <code>/opt/wallet/server/cwallet.sso</code> If SSL is enabled for EM Gateway but the wallet is in a different location, you must replace the default path with the full path to the actual location during installation.</td>
<td>-</td>
</tr>
</tbody>
</table>

### PDC Pricing Components Queue Information

During the installation, you must specify the system connection information of the server on which the JMS queue for PDC pricing component data resides. PDC publishes pricing component data into this queue. ECE listens on this JMS queue to consume the pricing component data.

| Field or Option         | Description                                                                                                                                                                                                 |
|-------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|
| Host Name               | The IP address or the host name of the computer on which the PDC JMS queue resides.                                                                                                                         |       |
| Port Number             | The port number of the computer on which the PDC JMS queue resides.                                                                                                                                          |       |
| User Name               | The user for logging in to the server on which the PDC JMS queue resides.                                                                                                                                       |       |
| Password                | The password for logging in to the server on which the PDC JMS queue resides.                                                                                                                                     |       |
| PDC Keystore Password   | The password used to access the SSL keystore file.                                                                                                                                                               |       |
| Keystore Path           | The full path to the SSL keystore file.                                                                                                                                                                         |       |
This chapter describes pre-installation tasks for Oracle Communications Billing and Revenue Management Elastic Charging Engine (ECE) 12.0.

About Pre-Installation Tasks

You must perform certain tasks before installing or upgrading ECE. Some tasks you only need to perform for an ECE integrated installation. See the following topics for the pre-installation tasks:

- Pre-Installation Tasks Common to All ECE Installations
- Pre-Installation Tasks for an ECE Integrated Installation
- Pre-Installation Tasks for ECE Software Upgrade

Important: (Linux) The ece_provision script is not supported from ECE 12.0. You must manually apply the Oracle Linux network configuration changes on your environment to prepare machines in your topology for a distributed ECE installation.

Pre-Installation Tasks Common to All ECE Installations

This section describes the pre-installation tasks you must perform that are common to all ECE installations.

Installing Groovy

Groovy is used for launching the Elastic Charging Controller (ECC), which is the ECE command line interface. The ECC is an extension of the Groovy Shell (groovysh) for ECE.

Install Groovy on the driver machine and set it in your PATH environment variable. See the discussion in your Groovy documentation for instructions on installing and configuring Groovy.

Installing Java Development Kit

Install Oracle Java Development Kit (JDK) and set it in your PATH environment variable. The JRE is required for the installer process.

See the discussion in the Oracle JDK documentation for information about installing JDK.
Installing Oracle Coherence

Install Oracle Coherence and set the path to the Coherence libraries in your PATH environment variable. The Coherence libraries are required for the installer process.

See the discussion in the Oracle Coherence documentation for information about installing Oracle Coherence.

Obtaining Required JAR Files

Obtain the following JAR files and save them in a directory of your choice on the driver machine. Note the location of the JAR files; you are required to specify this location during the ECE installation:

Table 4–1 Required JAR Files

<table>
<thead>
<tr>
<th>File</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ojdbc7.jar</td>
<td>Download this file from the following page on Oracle Technology Network Web site in the “Oracle Database 12c Release 1 (12.1.0.1) JDBC Drivers &amp; UCP” section: <a href="http://www.oracle.com/technetwork/database/features/jdbc/jdbc-drivers-12c-download-1958347.html">http://www.oracle.com/technetwork/database/features/jdbc/jdbc-drivers-12c-download-1958347.html</a></td>
</tr>
</tbody>
</table>
| wlthint3client.jar    | This file is available in the Oracle WebLogic Server client package. **Note:** If you choose to use two JMS providers, both WebLogic Server and another provider, ensure that you do the following after installation on the driver machine:  
  - copy the other JMS provider’s client JARs to the `ECE_home/occeserver/lib` directory.  
  - Rename the other JMS provider JAR file `wlthint3client.jar`.  
  - (When using the other JMS provider to publish ECE notification events) Update the `ECE_home/occeserver/JMSQueueConfiguration.xml` file to specify the InitialContextFactory and protocol information of the other JMS provider. |
| com.oracle.weblogic.bean.gen.general.api.jar | This file is available in the Oracle WebLogic Server client package. |
| groovy-all-2.4.11.jar | Download this file from the following page on Apache Groovy Web site in the “Maven Repository” section: [http://groovy-lang.org/install.html](http://groovy-lang.org/install.html) |
| coherence.jar         | This file is available in the Oracle Coherence package. |
| coherence-login.jar   | This file is available in the Oracle Coherence package. |
| coherence-work.jar    | This file is available in the Oracle Coherence package. |
| kvclient-18.3.9.jar   | (Optional) You need this file only if you are using Oracle NoSQL Database. This file is available in the Oracle NoSQL Database package. |
Creating the ECE User Account

Create the user account that is to be the primary user running ECE in your environment. The ECE user is a UNIX account used for password-less SSH.

You create the user account on the driver machine (the primary administrator machine). It is required that all machines have the same user name configured.

Note the user name; you will be required to specify the user name during the ECE installation process.

To create the user account:
1. Log in to the driver machine.
2. Enter the following commands:
   ```
   useradd user_name
   passwd user_name
   ```
   where `user_name` is the name of the user.
3. When prompted, enter the password for the user.

See the discussion in your Linux documentation for more information about the `useradd` command.

Establishing Two-Way Password-less SSH Logins

Establish two-way password-less SSH logins between all the physical servers in your cluster: between the driver machine and each server machine and between all server machines.

If you will install an ECE standalone system on one machine only, a password-less SSH login is also required for the ECE user on the standalone machine.

To establish two-way password-less SSH logins, perform the following steps on each machine:
1. Log in to the ECE machine as the ECE user.
2. Run the following commands:
   ```
   ssh-keygen -t dsa
   ssh-copy-id -i ~/.ssh/id_dsa.pub user@host
   ```
   where:
user is the name of the ECE user.

host is the name of the server for which the password-less SSH is being established.

If you will install an ECE standalone system on one machine, host in the ssh-copy-id command must be localhost.

The number of ECE nodes you can start simultaneously is affected by the limitation on how many simultaneous SSH connections the machines in your environment can make from or to another machine. The start command, by default, attempts to start ten nodes simultaneously using ten different threads. Ensure that your maximum number of open sessions permitted per network connection is less than the number of nodes you want to start simultaneously from the driver machine.

Pre-Installation Tasks for an ECE Integrated Installation

For an ECE integrated installation, you perform the pre-installation tasks common to all ECE installations, (see “Pre-Installation Tasks Common to All ECE Installations”) and also the tasks described in this section.

Installing and Configuring Oracle Database

Important: If you want to persist all the ECE data, you must use Oracle Database. You can use the BRM database to persist the ECE data. However, you can also create a new database if required.

If you want to persist only rated events, you can use Oracle NoSQL Database. See "Installing and Configuring Oracle NoSQL Database" for more information.

Important: ECE 12.0 does not support secure sockets layer (SSL)-enabled database. If you are using SSL-enabled BRM database, ensure that you use a non-SSL port number for ECE installation. If you are creating a new database, ensure that SSL is not configured for your 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 ECE database.
- (Optional) Install Oracle Partitioning. You need this to partition the tables in your ECE database.
- (Optional) Create ECE tablespaces and temporary tablespaces for the ECE schema, to store the ECE data.

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

You can use an existing schema for ECE persistence or create a new schema user during the ECE installation. If you are using existing schema user, the user must have granted select on v$database.

To grant select permission, log in to your database as user sysdba and run the following SQL grant select command:

```
SQL> grant select on v_$database to db_user
```

Installing and Configuring Oracle NoSQL Database

ECE publishes rated events to a data store in Oracle NoSQL Database where the events are stored temporarily before being extracted and sent to the BRM system.

**Important:** ECE uses Oracle NoSQL Database only to temporarily store rated event information. In ECE 12.0, Oracle NoSQL Database is supported only for backward compatibility.

To store all the ECE data including the rated event information in the database, you must use Oracle Database.

When you install Oracle NoSQL Database, note the database connection information (such as host name, port number, and data store name). You must specify this information during the ECE installation process. See “Oracle NoSQL Database Information”.

When configuring NoSQL Database, set up the NoSQL data store to which ECE can publish rated events. Size the Oracle NoSQL database key-value data store installation to match your ECE charging server topology.

After you install an Oracle NoSQL database, you can start the Oracle NoSQL database data store with either a single-node or multiple-node configuration:

- A single-node data store configuration is included with the Oracle NoSQL database installation and can be started in a nonproduction ECE environment.

- A multiple-node NoSQL data store configuration is required for running ECE in a production environment and requires additional configuration to make multiple nodes work as an Oracle NoSQL database cluster.

See the discussion in the Oracle NoSQL Database documentation for information about installing NoSQL Database, setting up a NoSQL data store, and setting up high availability and performance for the Oracle NoSQL Database.

ECE uses the Oracle NoSQL database client library for connecting and interacting with the Oracle NoSQL database. The Oracle NoSQL database client library is installed when you install the ECE server software. You provide the Oracle NoSQL database connection information when you install ECE.

About Oracle NoSQL Data Store Partitions

An Oracle NoSQL data store is divided into partitions. Partitions store the rated events processed by each Rated Event Formatter instance and are associated with the target BRM database schema to which the rated events are to be exported. The partitions are automatically created for each BRM database schema.
**Tip:** One BRM schema is not mapped to one Oracle NoSQL database partition. The Oracle NoSQL database can have any preconfigured number of partitions based on the data size. The Rated Event Formatter partition configuration entry actually refers to the BRM database schema, not the Oracle NoSQL partition.

**Installing and Configuring BRM**

Oracle Communications Billing and Revenue Management (BRM) is required in the charging system to perform billing, subscription management, and financial management.

ECE supports BRM on Linux x86 or x86-64 or Solaris SPARC (64bit).

Take note of the BRM connection information (such as host names, port numbers, and passwords) when you install BRM. You will be required to specify this information during the ECE installation process. See "External Manager Gateway Information" for details about the information you will need.

**Setting Up Database Queues for ECE-to-BRM Mediation**

When configuring BRM, set up the following Oracle Advanced Queuing (AQ) database queues (DBMS AQs):

- A database queue to which the BRM Account Synchronization DM can publish business events for ECE to consume.
- A database queue to which ECE can move failed update requests from BRM (referred to as the Suspense Queue).
- A database queue to which ECE can publish acknowledgement events for BRM to consume (used when processing rating requests from BRM, such as during rerating).

See "Creating Required Queues for BRM" for details about the information you will need.

See BRM Installation Guide for information about installing BRM.

**Installing and Configuring Pricing Design Center**

Pricing Design Center (PDC) is required for creating pricing data (pricing components and setup components) used by ECE for rating usage requests.

ECE supports PDC on Linux x86 or x86-64 or Solaris SPARC (64bit).

During the PDC installation process, when prompted to specify whether you want to integrate ECE with PDC, select Yes. PDC will create a JMS queue (a work item queue) where it will publish pricing data. The ECE Pricing Updater will listen on this queue for pricing updates so that it can dequeue and load the data into ECE.

If you have already installed PDC but did not specify to integrate it with ECE, then manually set up a JMS queue on a PDC WebLogic server and configure PDC to publish pricing data to this queue.

Note the connection information (such as host name, port number, and password) for the WebLogic server where the JMS queue resides. You will be required to specify this information during the ECE installation process. See "WebLogic Server Information" for details about the information you will need.
See the discussion in the Pricing Design Center documentation for information about installing and configuring PDC.

See the discussion in the Oracle WebLogic Server documentation for information about setting up JMS queues.

(Diameter Gateway) Installing SCTP Package

If you plan to use Diameter Gateway for network integration for online charging, and you plan to use Stream Control Transmission Protocol (SCTP), verify that your operating system has SCTP support. If your operating system does not have SCTP, you must install the SCTP system package for your operating system version.

Pre-Installation Tasks for ECE Software Upgrade

This section describes the pre-installation tasks you must perform if you have an existing ECE installation.

Important: If you have an existing ECE installation, note the following:

- A direct upgrade from an existing ECE release is not supported.
- ECE 12.0 supports complete installation only. For upgrading to ECE 12.0, you can install ECE 12.0 using the Complete option and reconfigure the configuration and mediation files to match your existing release.

- Make a complete offline backup of your existing ECE configuration. See "Backing Up Your Existing Configuration" for more information.
- Create a home directory for ECE 12.0. See "Creating the Home Directory for ECE 12.0" for more information.
- To enable persistence of all the ECE data in the database, use Oracle Database. See "Installing and Configuring Oracle Database" for more information.
- If you have an existing installation of ECE integrated with Oracle Communications Billing and Revenue Management (BRM) and Pricing Design Center (PDC), do the following:
  1. Install the compatible version of BRM on the machine on which BRM is installed. See the corresponding BRM 12.0 Patch Set Installation Guide for installing BRM.
  2. Install the compatible version of PDC on the machine on which PDC is installed. See BRM PDC 12.0 Installation Guide for installing PDC.
- Install the recommended version of the other required software on the machine on which ECE is installed. See "Software Requirements" for more information.
- Install the recommended version of Oracle Coherence. See "Installing Oracle Coherence" for more information.
- (Optional) Install the recommended version of Oracle NoSQL Database as applicable. See "Installing and Configuring Oracle NoSQL Database" for more information.
- Obtain the required JAR files. See "Obtaining Required JAR Files" for more information.
**Back up your existing configuration**

Back up your existing configuration and installation area (the ECE installation directory and its content: *ECE_home*). In particular, make sure you back up all customized files.

---

**Important:** Store this backup in a safe location. The data in these files are necessary if you encounter any issues in the installation process.

---

**Creating the Home Directory for ECE 12.0**

Create a directory to be the ECE 12.0 home directory. Because you have your old release on the same driver machine, be careful to specify the home details for ECE 12.0 when you run the ECE 12.0 Installer. The home details consist of the home directory path and a unique name you give to the new installation.

When you run the Installer, it displays the home details of any old release installations it detects on your driver machine in the *Specify Home Details* list.
This chapter describes how to install Oracle Communications Billing and Revenue Management Elastic Charging Engine (ECE). Before you install ECE, read these chapters:

---

**Important:** If you have an existing ECE installation, note the following:

- A direct upgrade from an existing ECE release is not supported.
- ECE 12.0 supports only complete installation. For upgrading to ECE 12.0, you can install ECE 12.0 using the **Complete** option and reconfigure the configuration and mediation files to match your existing release.

---

- ECE Installation Overview
- Planning Your ECE Installation
- ECE System Requirements
- ECE Pre-Installation Tasks

**About the GUI Installation and Silent Installation**

You can install ECE by using the GUI installation or the silent installation. The silent installation procedure enables you to perform a noninteractive installation of ECE. You can use the silent installation to install ECE quickly on multiple systems.

The silent installer uses a response file in which you specify installation settings. To obtain the response file, you first run the GUI installation, which generates the response file. See "ECE Installation Options" for more information.

For installation instructions, see the following sections:

- Installing ECE by Using the GUI Installation
- Installing ECE by Using the Silent Installation

**Installing ECE by Using the GUI Installation**

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

- To install an ECE standalone system, select the **Standalone** option.
This option installs a self-contained, nonproduction version of ECE that is not integrated with Oracle Communications Billing and Revenue Management (BRM) or Pricing Design Center (PDC). Use the standalone system for evaluation, demonstration, and functional testing.

See "Installing a Standalone ECE System" for more information.

- To install an ECE integrated system, select the Complete option.

See "Installing ECE" for more information.

Obtaining the ECE 12.0 Software

To obtain the ECE 12.0 software:

1. Create a temporary directory (temp_dir).
2. Go to the Oracle software delivery Web site:
   http://edelivery.oracle.com
3. Sign in with your user name and password.
4. Search for the ECE software pack and select the ECE 12.0 software pack from the search results.
5. From the Platform list, select the platform.
6. Download the ECE software pack to temp_dir.
7. Unzip the ECE software pack and extract the contents to temp_dir.

Installing ECE

To install ECE, select the Complete installation option, which installs ECE Server, ECE Diameter Gateway, and all ECE integration packs. Use this option for an ECE integrated installation.

During the installation, you will need the required information that you previously collected. See "Information Requirements."

---

**Note:** If you are upgrading an existing ECE installation, select the same options and provide the same values that you provided during the previous installation.

---

To install ECE:

1. Obtain the ECE software. See "Obtaining the ECE 12.0 Software".
2. 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 installer JAR file. For example, the jarfile for installing ECE 12.0 is ocece-12.0.0.1.0_generic.jar.
To start the GUI installer and install PDC using the `oraInventory` directory in a different location:

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

where `FilePath` is the path to the directory in which the `oraInst.loc` file is located.

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 screen appears.

3. Click Next.

The Specify Inventory Directory and Credentials screen appears.

---

**Note:** The installer creates an **Inventory** directory if it does not detect any installed Oracle products on the system. The **Inventory** directory manages all Oracle products installed on your system.

---

In this screen, enter the following if you do not want to accept the defaults:

- Full path of the inventory directory
- Name of the operating system group that has write permission to the inventory directory

4. Click Next.

The Installation Location screen appears.

5. Enter the full path or browse to the directory in which you want to install ECE 12.0.

---

**Note:** If you have an existing ECE installation, ensure that you do not enter the path to the same directory in which the existing ECE release is installed. You can install ECE 12.0 in a different directory on the same machine.

---

6. Click Next.

The Select Installation Type screen appears.

7. Select Complete, and click Next.

The Select ECE Security Options screen appears.

8. Select one of the ECE security options described in the following table.

   For more information, see *BRM Elastic Charging Engine Security Guide*.

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Security disabled</td>
<td>Enables no security configurations. (Single server installation only)</td>
</tr>
</tbody>
</table>
9. Click Next.
The Enable Persistence screen appears.

10. Do one of the following:
    ■ To persist all the ECE data in the database, select Persistence enabled and proceed to step 13.
    ■ To persist only the rated events in the database, select Persistence disabled and proceed to step 11.

11. Click Next.
The Oracle NoSQL Database Details screen appears.

12. Specify the NoSQL database connection information:
    a. In the Host Name field, enter the host name or IP address of the machine on which the Oracle NoSQL database is installed.
    b. In the Port Number field, enter the port number assigned to the NoSQL database service.
    c. In the NoSQL Datastore Name (database name) field, enter the name of the NoSQL data store into which ECE will publish rated events.
       This is where Rated Event Publisher writes rated events generated by the ECE server.

13. Click Next.
The ECE Persistence Schema Creation screen appears.

14. Do one of the following:
    ■ To create user and tables for the ECE persistence schema, select Create schema user and tables and proceed to step 15.
    ■ To create only the tables for the ECE persistence schema, select Create tables Only and proceed to step 19.
    ■ If you want to use existing schema users and tables, select Use existing schema user and tables and proceed to step 19.

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Security enabled without SSL</td>
<td>Enables the following security configurations:</td>
</tr>
<tr>
<td></td>
<td>■ JMX security</td>
</tr>
<tr>
<td></td>
<td>■ Authorized hosts list</td>
</tr>
<tr>
<td></td>
<td>■ Coherence node authentication</td>
</tr>
<tr>
<td>Security enabled with SSL</td>
<td>Enables the following security configurations:</td>
</tr>
<tr>
<td></td>
<td>■ SSL encryption</td>
</tr>
<tr>
<td></td>
<td>(Impacts overall system performance)</td>
</tr>
<tr>
<td></td>
<td>■ JMX security</td>
</tr>
<tr>
<td></td>
<td>■ Authorized hosts list</td>
</tr>
<tr>
<td></td>
<td>■ Coherence node authentication</td>
</tr>
<tr>
<td></td>
<td>■ BRM SSL security authentication</td>
</tr>
<tr>
<td></td>
<td>■ PDC SSL security authentication</td>
</tr>
<tr>
<td></td>
<td>■ EM Gateway SSL security authentication</td>
</tr>
</tbody>
</table>
15. Click Next.
   The ECE Persistence Database Details screen appears.

16. Specify the information required to connect to the ECE persistence database:
   a. In the **Host Name** field, enter the host name or IP address of the machine on which the ECE persistence database is installed.
   b. In the **Port Number** field, enter a non-SSL port number assigned to the ECE persistence database service.
   c. In the **User Name** field, enter the SYSDBA or system user name.
   d. In the **Password** field, enter the ECE persistence database user password.
   e. In the **Service Name** field, enter the name of the ECE persistence database service.

   This is where all the ECE data is persisted by the ECE server.

---

**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.

---

17. Click Next.
   The Persistence Schema Details screen appears.

18. Specify the information required to create the ECE schema in the ECE persistence database and proceed to step 21:
   a. In the **User Name** field, enter the ECE persistence schema user name.
   b. In the **Password** field, enter a password for the ECE persistence schema user.
   c. In the **Confirm Password** field, enter the ECE persistence schema user password again.
   d. In the **ECE Tablespace** field, enter the name of the tablespace for the ECE schema.
   e. In the **Temp Tablespace** field, enter the name of the temporary tablespace for the ECE schema.

19. Click Next.
   The Persistence Schema Details screen appears.

20. Specify the information required to connect to the existing ECE persistence schema:
   a. In the **User Name** field, enter the ECE persistence schema user name.
   b. In the **Password** field, enter the ECE persistence schema password.
   c. In the **JDBC URL** field, enter the following colon-separated values:

```
Driver:@HostName:Port:ServiceName
```

   where:

   **Driver** is the driver used to connect to Oracle Database.

   **HostName** is the IP address or the host name of the computer on which the ECE persistence database is configured.
Port is the non-SSL port number assigned to the ECE persistence database service.

ServiceName is name of the ECE persistence database service.

For example:
jdbc:oracle:thin:@localhost:1521:orcl

21. Click Next.

The Configure Rated Event Partitions screen appears.

---

Note: If you selected the Use existing schema user and tables option in step 14, this screen does not appear. Proceed to step 23.

---

22. Specify the information required to configure the Rated Event Partitions:

a. In the Storage INITIAL field, enter the RatedEvent table Storage INITIAL field data.

b. In the Storage NEXT field, enter the RatedEvent table Storage NEXT field data.

c. In the Storage SUBPARTITIONS field, enter the RatedEvent table Storage SUBPARTITIONS field data.

23. Click Next.

The Config Data Details screen appears.

24. In the Directory field, enter the path or browse to the directory where ECE gets the XML files that contain configuration data (mediation specifications).

After installation, when you load data into ECE, the loading utility reads and loads configuration data from this directory.

25. Click Next.

The Pricing Data Details screen appears.

26. In the Directory field, enter the path or browse to the directory where ECE gets the XML files that contain pricing data.

After installation, when you load data into ECE, the loading utility reads and loads pricing data from this directory.

27. Click Next.

The Customer Data Details screen appears.

28. In the Directory field, enter the path or browse to the directory where ECE gets the XML files that contain customer data.

After installation, when you load data into ECE, the loading utility reads and loads customer data from this directory.

29. Click Next.

The Cross-Reference Data Details screen appears.

30. In the Directory field, enter the path or browse to the directory where ECE gets the XML files that contain cross-reference data.

After installation, when you load data into ECE, the loading utility reads and loads cross-reference data from this directory.
31. Click Next.
   The Persistence Data Details screen appears.

32. In the Directory field, enter the path or browse to the directory into which the ECE BrmCdrPluginDirect plug-in will write call detail record (CDR) files of rated events.

   This is the directory where the plug-in stores completed CDR files that are ready to be processed by BRM.

33. Click Next.
   The ECE Cluster Details screen appears.

34. Enter information about the ECE cluster:
   a. In the User Name for Host Machines field, enter the user name you specified when you created the ECE user account prior to installation. All machines in the cluster must have the same user name.

   This user name is used by the Elastic Charging Controller to identify the remote machines on which to deploy ECE.

   b. In the Java Heap Settings field, specify the memory to allocate to each node in the ECE cluster.

   The memory applies to each node for the driver machine and all server machines.

   c. In the Cluster Name field, enter the cluster name used by applications to identify ECE in the cluster. For example, Oracle Enterprise Manager Cloud Control uses the cluster name to locate ECE nodes for monitoring.

   The cluster name must contain fewer than 32 characters.

35. Click Next.
   The Coherence Grid Security screen appears.

   **Note:** If you selected the Security disabled option, this screen does not appear. Proceed to step 37.

36. Specify the machines allowed to be part of the Coherence cluster and the credentials required for accessing the cluster.

   To specify the machines, do one or both of the following:

   - In the Host Details in comma separated format field, list the host names or IP addresses of all machines on which ECE nodes will reside. Separate each value with a comma.

     Include your computer name in this field. Do not enter localhost or a loopback address.

     Include all server machines across which the Coherence grid is deployed and any other machine that is to be part of the grid.

   - Specify a range of allowed addresses for hosts in the same subnet as follows:

     In the Host Details Range from IP Address field, enter the valid IP address that starts the range.
In the **Host Details Range to IP Address** field, enter the valid IP address that
ends the range.

To specify the credentials required to access the cluster:

- In the **Alias Name for Coherence grid security** field, enter the account alias that defines the administrator for securing the Coherence cluster.
- In the **Password for the alias** field, enter the password used to access the cluster security key in the Coherence keystore (the `ECE_home/occeserver/config/server.jks` file).

  This is the password for Coherence cluster security.

  You use this password when enabling secure socket layer (SSL).

  See the discussion about Coherence cluster security in *BRM Elastic Charging Engine Security Guide*.

37. Click **Next**.

The KeyStore Credentials screen appears.

38. Specify the keystore credential information required for the ECE installation:

   a. In the **Key Password** field, enter the password ECE uses to access the server JKS file.
   
   b. In the **Certificate store password** field, enter the password used to access the server JKS file.
   
   c. In the **DName** (Distinguished Name) field, specify the credentials that define what users are authorized to do regarding cluster security.

      Examples:

      `CN=Administrator,OU=Rating,O=CompanyB`

      Or:

      `CN=Developer,OU=ECE`

      where:

      CN is the common name for the user.

      OU is the organizational unit of the user.

      O is the organization of the user.

      The combined **DName** values are similar to a group in UNIX.

      **Tip:** The value set here (in creating the certificate) is used for authentication in the cluster and must be the same as the value used in the `ECE_home/occeserver/config/permissions.xml` file, which is created after installation and used for authorization in the cluster.

      You use the DName value when enabling SSL.

      The DName value is used as a command line parameter for creating the `server.jks` keystore.

39. Click **Next**.

The Oracle Wallet Details screen appears.

40. Specify the ECE wallet details to store the configuration data:
- (Optional) In the **Wallet Location** field, enter the full path or browse to the directory in which you want to store the Oracle wallet for ECE.

- In the **Wallet Password** field, enter the password for the ECE wallet.

- In the **Confirm Wallet Password** field, enter the password for the ECE wallet again.

41. Click **Next**.

The ECE Notification Queue Details screen appears.

42. Enter the Java Message Service (JMS) credentials for the JMS server on which the ECE notification queue (JMS topic) is to reside.

ECE publishes notification events into this JMS queue (JMS topic), which external systems can use to obtain data for their own processing.

After you install ECE, you run a post-installation script that creates the JMS queue (JMS topic) on the server.

a. In the **Host Name** field, enter the host name of the server on which the JMS queue (JMS topic) resides.

b. In the **Port Number** field, enter the port number of the server on which the JMS queue (JMS topic) resides.

c. In the **User Name** field, enter the user name for logging in to the server on which the JMS queue (JMS topic) resides.

d. In the **Password** field, enter the password for logging in to the server on which the JMS queue (JMS topic) resides.

e. In the **Connection Factory Name** field, enter the connection factory name used to create connections to the JMS queue (JMS topic) queue.

After installing ECE, you run an ECE post-installation script that creates the JMS queue (JMS topic) on the server. The connection factory name entered here is used by the script to create connections to the JMS queue.

f. In the **Topic Name** field, enter the name of the JMS queue on the server, to which ECE publishes notification events.

After installing ECE, you run a post-installation script that creates the JMS queue (JMS topic) on the server. The topic name entered here is the name the ECE post-installation script uses to create the JMS queue.

g. In the **Suspense Queue Name** field, enter the name for the suspense queue, to which ECE pushes the failed notifications.

43. Click **Next**.

The ECE Notification Queue SSL Details screen appears.

44. Enter SSL information required to connect to the Java Message Service queue to which ECE publishes notification events:

a. If you do not want to use SSL to encrypt communication between ECE and the JMS queue, select the **Disable SSL** option.

   If you select this option, do not enter values in the following fields.

b. In the **Keystore password** field, enter the password used to access the SSL keystore file.

c. In the **Keystore location** field, enter the full path to the SSL keystore file.
45. Click Next.

The Diameter Gateway Details screen appears.

46. Enter information that Diameter clients use to identify your Diameter Gateway server:

   a. If you do not want Diameter Gateway to start when ECE starts, select the **Skip** option.

      If you select this option, do not enter values in the following fields.

   b. In the **Origin Host** field, enter the value for the Origin-Host attribute-value pair (AVP) to be sent in the Diameter request.

      This is a unique identifier that you assign your Diameter Gateway server on its host. It can be any string value.

      The value set here is used by the Diameter client to identify your Diameter Gateway server as the connecting Diameter peer that is the source of the Diameter message.

      For more information about how the Origin-Host AVP can be specified, refer to Internet Engineering Task Force (IETF) Network Working Group RFC 3588 (Diameter Base Protocol).

   c. In the **Origin Realm** field, enter the value for the Origin-Realm AVP to be sent by the Diameter Gateway in outgoing Diameter requests.

      This is the signaling realm (domain) that you assign your Diameter Gateway server.

      The value set here is used by Diameter clients to identify your Diameter Gateway server as the source of the Diameter message.

      For more information about how the Origin-Realm AVP can be specified, refer to Internet Engineering Task Force (IETF) Network Working Group RFC 3588 (Diameter Base Protocol).

The Diameter Gateway details you enter in this screen apply to one Diameter Gateway node instance that listens to all network interfaces for Diameter messages, which is suitable for basic testing directly after installation.

For a distributed environment, you must add Diameter Gateway node instances to your topology and configure a unique network interface for each instance after installation.

47. Click Next.

The RADIUS Gateway Details screen appears.

48. Enter information that RADIUS clients use to identify your RADIUS Gateway server:

   a. If you do not want RADIUS Gateway to start when ECE starts, select the **Skip** option.

      If you select this option, do not enter values in the following fields.

   b. In the **Name** field, enter the name of the RADIUS Gateway instance.

   c. In the **Port** field, enter the port number assigned to RADIUS Gateway.

   d. In the **Shared Secret** field, enter the common password shared between the RADIUS Gateway server and Network Access Server (NAS). It is used by the RADIUS protocol for security.
Installing Elastic Charging Engine

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In the Wallet Location field, enter the path to the Oracle wallet that contains
the SSL authentication and signature credentials (such as private keys, and
certificates) and the root key for the RADIUS Gateway server.

The RADIUS Gateway details you enter in this screen apply to a single RADIUS
Gateway instance (node) that listens to all network interfaces for RADIUS
messages, which is suitable for basic testing directly after installation.

For a distributed environment, you must add RADIUS Gateway instances (nodes)
to your topology and configure a unique network interface for each instance after
installation.

49. Click Next.

The BRM Database Connection Details screen appears.

50. Specify the BRM database connection information:

   a. In the JDBC URL field, enter the following colon-separated values:

      \textit{Driver:HostName:Port:ServiceName}

      where:

      \textit{Driver} is the driver used to connect to the BRM database.

      \textit{HostName} is the IP address or the host name of the computer on which the
      BRM database is configured.

      \textit{Port} is the port number assigned to the BRM database service.

      \textit{ServiceName} is name of the BRM database service.

      For example:

      \textit{jdbc:oracle:thin:@localhost:1521:PINDB}

   b. In the User Name field, enter the BRM database schema user name.

   c. In the Password field, enter the password for the BRM database user.

   d. In the Queue Name field, enter the name of the Oracle Advanced Queuing
      (AQ) database queue that the Account Synchronization DM uses to publish
      business events for ECE to consume.

      ECE listens on this queue for loading update requests from BRM.

   e. In the Suspense Queue Name field, enter the name of the Oracle AQ database
      queue to which ECE moves events for failed update requests for later
      reprocessing.

      After installing ECE, you can use an ECE post-installation script to create this
      queue. When prompted by the script, enter the queue name you entered here.

   f. In the Acknowledgement Queue Name field, enter the name of the Oracle AQ database
      queue to which ECE publishes acknowledgments for BRM.

      For example, ECE uses this queue to send acknowledgment events to BRM
      during the rerating process, indicating that the process can start or finish.

      After installing ECE, you can use an ECE post-installation script to create this
      queue. When prompted by the script, enter the queue name you entered here.

51. Click Next.

The BRM Gateway Details screen appears.

52. Enter the BRM Gateway connection details:
a. In the Host Name field, enter the IP address or the host name of the computer on which BRM is configured.

b. In the CM Port field, enter the port number assigned to the CM.

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

d. In the Password field, enter the password for logging in to BRM.

e. If you will not use SSL to encrypt communication between ECE and BRM through BRM Gateway, select the Disable SSL option.

If you select this option, do not change the value in the following field.

f. If SSL is enabled for BRM Gateway but the Oracle wallet file containing the SSL trusted certificates for BRM Gateway is not in the default location (/opt/wallet/client/cwallet.sso), replace the default path in the Wallet File Absolute Path field with the full path to the actual location.

53. Click Next.

The External Manager (EM) Gateway Details screen appears.

54. Specify the EM Gateway information:

a. In the Number EM Gateways field, enter the number of EM Gateway instances you want ECE to run automatically when you start EM Gateway.

b. In the Starting Port Number field, enter the port number assigned to EM Gateway.

If you have more than one EM Gateway instance, this is the starting port number. Subsequent port numbers increase by one for each additional EM Gateway instance. For example, if the starting port number is 15502 and you specify three EM Gateway instances, ports 15502, 15503, and 15504 are used by EM Gateway processes.

Ensure that no other processes on the machine use port numbers assigned to EM Gateway instances.

c. If you do not want to use SSL to encrypt communication between BRM and ECE through EM Gateway, select the Disable SSL option.

If you select this option, do not enter or change values in the following fields.

d. If you do not want authentication to be performed to check whether EM Gateway is allowed to communicate with ECE, select the Client Authentication Disabled option.

If you select this option, do not change the value in the following fields.

e. If SSL is enabled for EM Gateway but the Oracle wallet file containing the SSL trusted certificates for EM Gateway is not in the default location (/opt/wallet/server/cwallet.sso), replace the default path in the Client wallet field with the full path to the actual location.

55. Click Next.

The PDC Pricing Components Queue Details screen appears.

56. Enter the system connection information of the server on which the JMS queue for PDC pricing component data resides.

PDC publishes pricing component data into this queue. ECE will listen on this JMS queue to consume the pricing component data.
In the **Host Name** field, enter the IP address or the host name of the computer on which the PDC JMS queue to which PDC publishes the pricing data resides.

b. In the **Port Number** field, enter the port number of the computer on which the PDC JMS queue resides.

c. In the **User Name** field, enter the user name for logging in to the server on which the PDC JMS queue resides.

d. In the **Password** field, enter the password for logging in to the server on which the PDC JMS queue resides.

e. If you will not use SSL to encrypt communication between BRM and PDC, select the **Disable SSL** option.

   If you select this option, do not enter values in the following fields.

f. In the **PDC Keystore Password** field, enter the password used to access the SSL keystore file.

g. In the **Keystore Path** field, enter the full path to the SSL keystore file.

57. Click **Next**.

   The Third-Party Library Details screen appears.

58. In the **Directory** field, enter the path or browse to the directory that contains the JAR files required by ECE.

59. Click **Next**.

   The Java Home Location screen appears.

60. Enter the path or browse to the directory in which the compatible version of Java is installed.

61. Click **Next**.

   The Installation Summary screen appears.

62. Review the selections you have made in the preceding screens, and click **Install**.

   The Installation Progress screen appears.

---

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

---

63. When the installation is done, click **Next**, the Installation Complete screen appears.

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

The installer checks for all required software and displays errors if it detects any missing or unavailable components or if any connectivity issues occur.

For information about verifying the installation of ECE, see "Verifying the ECE Installation."

For information about ECE installer logs, see "Troubleshooting the ECE Installation."
Installing a Standalone ECE System

To install a standalone ECE system, select the **Standalone** installation option. An ECE standalone system is a self-contained, nonproduction version of ECE that is not integrated with BRM or Pricing Design Center (PDC). Use the standalone system for evaluation, demonstration, and functional testing.

During the installation, refer to the required information that you previously collected. See "Information Requirements".

To install a standalone ECE system:

1. Obtain the ECE software. See "Obtaining the ECE 12.0 Software".
2. 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 installer JAR file. For example, the `jarfile` for installing ECE 12.0 is `ocece-12.0.0.1.0_generic.jar`.
   - To start the GUI installer and install PDC using the `oraInventory` directory in a different location:
     ```
     Java_home/bin/java -jar jarfile -invPtrLoc FilePath/oraInst.loc
     ```
     where `FilePath` is the path to the directory in which the `oraInst.loc` file is located.
   - 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 screen appears.

3. Click **Next**.

   The Specify Inventory Directory and Credentials screen appears.

   **Note:** The installer creates an **Inventory** directory if it does not detect any installed Oracle products on the system. The **Inventory** directory manages all Oracle products installed on your system.

   In this screen, enter the following if you do not want to accept the defaults:
   - Full path of the inventory directory
   - Name of the operating system group that has write permission to the inventory directory

4. Click **Next**.

   The Select Installation Type screen appears.

5. Select **Standalone**, and click **Next**.
The Specify Home Details screen appears.

6. Enter the full path or browse to the directory in which you want to install ECE 12.0.

7. Click Next.

The Select ECE Security Options screen appears.

8. Select one of the ECE security options described in the following table.

For more information, see BRM Elastic Charging Engine Security Guide.

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Security disabled</td>
<td>Enables no security configurations. (Single server installation only)</td>
</tr>
<tr>
<td>Security enabled without SSL</td>
<td>Enables the following security configurations:</td>
</tr>
<tr>
<td></td>
<td>■ JMX security</td>
</tr>
<tr>
<td></td>
<td>■ Authorized hosts list</td>
</tr>
<tr>
<td></td>
<td>■ Coherence node authentication</td>
</tr>
<tr>
<td>Security enabled with SSL</td>
<td>Enables the following security configurations:</td>
</tr>
<tr>
<td></td>
<td>■ SSL encryption (Impacts overall system performance)</td>
</tr>
<tr>
<td></td>
<td>■ JMX security</td>
</tr>
<tr>
<td></td>
<td>■ Authorized hosts list</td>
</tr>
<tr>
<td></td>
<td>■ Coherence node authentication</td>
</tr>
</tbody>
</table>

9. Click Next.

The Enable Persistence screen appears.

10. Do one of the following:

■ To persist all the ECE data in the database, select Persistence enabled and proceed to step 13.

■ To persist only the rated events in the database, select Persistence disabled and proceed to step 11.

11. Click Next.

The Oracle NoSQL Database Details screen appears.

12. Specify the NoSQL database connection information:

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

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

c. In the NoSQL Datastore Name (database name) field, enter the name of the NoSQL data store into which ECE will publish rated events.

This is where Rated Event Publisher writes rated events generated by the ECE server.

13. Click Next.

The ECE Persistence Schema Creation screen appears.
14. Do one of the following:

- To create user and tables for the ECE persistence schema, select **Create schema user and tables** and proceed to step 15.
- To create only the tables for the ECE persistence schema, select **Create tables Only** and proceed to step 19.
- If you want to use existing schema users and tables, select **Use existing schema user and tables** and proceed to step 19.

15. Click **Next**.

The ECE Persistence Database Details screen appears.

16. Specify the information required to connect to the ECE persistence database:

   a. In the **Host Name** field, enter the host name or IP address of the machine on which the ECE persistence database is installed.
   b. In the **Port Number** field, enter a non-SSL port number assigned to the ECE persistence database service.
   c. In the **User Name** field, enter the SYSDBA or system user name.
   d. In the **Password** field, enter the ECE persistence database user password.
   e. In the **Service Name** field, enter the name of the ECE persistence database service.

   This is where all the ECE data is persisted by the ECE server.

   **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.

17. Click **Next**.

The Persistence Schema Details screen appears.

18. Specify the information required to create the ECE schema in the ECE persistence database and proceed to step 21:

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

19. Click **Next**.

The Persistence Schema Details screen appears.

20. Specify the information required to connect to the existing ECE persistence schema:

   a. In the **User Name** field, enter the ECE persistence schema user name.
   b. In the **Password** field, enter the ECE persistence schema password.
c. In the JDBC URL field, enter the following colon-separated values:

\[Driver:@HostName:Port:ServiceName\]

where:

- **Driver** is the driver used to connect to Oracle Database.
- **HostName** is the IP address or the host name of the computer on which the ECE persistence database is configured.
- **Port** is the non-SSL port number assigned to the ECE persistence database service.
- **ServiceName** is name of the ECE persistence database service.

For example:

\[jdbc:oracle:thin:@localhost:1521:orcl\]

21. Click Next.

The Config Data Details screen appears.

22. In the Directory field, enter the path or browse to the directory where ECE gets the XML files that contain configuration data (mediation specifications).

After installation, when you load data into ECE, the loading utility reads and loads configuration data from this directory.

23. Click Next.

The Pricing Data Details screen appears.

24. In the Directory field, enter the path or browse to the directory where ECE gets the XML files that contain pricing data.

After installation, when you load data into ECE, the loading utility reads and loads pricing data from this directory.

25. Click Next.

The Customer Data Details screen appears.

26. In the Directory field, enter the path or browse to the directory where ECE gets the XML files that contain customer data.

After installation, when you load data into ECE, the loading utility reads and loads customer data from this directory.

27. Click Next.

The Cross-Reference Data Details screen appears.

28. In the Directory field, enter the path or browse to the directory where ECE gets the XML files that contain cross-reference data.

After installation, when you load data into ECE, the loading utility reads and loads cross-reference data from this directory.

29. Click Next.

The Persistence Data Details screen appears.

30. In the Directory field, enter the path or browse to the directory into which the ECE BrmCdrPluginDirect Plug-in will write call detail record (CDR) files of rated events.
This is the directory where the plug-in stores completed CDR files that are ready to be processed by BRM.

31. Click Next.

The ECE Cluster Details screen appears.

32. Enter information about the ECE cluster:
   
a. In the **User Name for Host Machines** field, enter the user name you specified when you created the ECE user account prior to installation. All machines in the cluster must have the same user name.
   
   This user name is used by the Elastic Charging Controller for identifying the remote machines on which to deploy ECE.
   
b. In the **Java Heap Settings** field, specify the memory to allocate to each node in the ECE cluster.
   
   The memory applies to each node for the driver machine and all server machines.
   
c. In the **Cluster Name** field, enter the cluster name used by applications to identify ECE in the cluster. For example, Oracle Enterprise Manager Cloud Control uses the cluster name to locate ECE nodes for monitoring.
   
   The cluster name must contain fewer than 32 characters.

33. Click Next.

The Coherence Grid Security screen appears.

---
**Note:** If you selected the **Security disabled** option, this screen does not appear. Go to step 34.

---

34. Specify the machines allowed to be part of the Coherence cluster and the credentials required for accessing the cluster.

To specify the machines, do one or both of the following:

- In the **Host Details in Comma Separated Format** field, list the host names or IP addresses of all machines on which ECE nodes will reside. Separate each value with a comma.

  Include your computer name in this field. Do not enter **localhost** or a loopback address.

  Include all server machines across which the Coherence grid is deployed and any other machine that is to be part of the grid.

- Specify a range of allowed addresses for hosts in the same subnet as follows:

  In the **Host Details Range from IP Address** field, enter the valid IP address that starts the range.

  In the **Host Details Range to IP Address** field, enter the valid IP address that ends the range.

To specify the credentials required to access the cluster:

- In the **Alias Name for Coherence Grid Security** field, enter the account alias that defines the administrator for securing the Coherence cluster.
In the **Password for the Alias** field, enter the password used to access the cluster security key in the Coherence keystore (the `ECE_home/oceceserver/configserver.jks` file).

This is the password for Coherence cluster security.

You use this password when enabling SSL.

35. **Click Next.**

The KeyStore Credentials screen appears.

36. **Specify the keystore credential information required for the ECE installation:**
   
   **a.** In the **Key Password** field, enter the password ECE uses to access the key in the server JKS file.
   
   **b.** In the **Certificate store password** field, enter the password used to access the server JKS file.
   
   **c.** In the **DName** (Distinguished Name) field, specify the credentials that define what users are authorized to do regarding cluster security.

Examples:

   `CN=Administrator,OU=Rating,O=CompanyB`

   Or:

   `CN=Developer,OU=ECE`

   where:
   
   CN is the common name for the user.
   
   OU is the organizational unit of the user.
   
   O is the organization of the user.
   
   The combined **DName** values are similar to a group in UNIX.

   **Tip:** The value set here (in creating the certificate) is used for authentication in the cluster and must be the same as the value used in the `ECE_home/oceceserver/config/permissions.xml` file, which is created after installation and used for authorization in the cluster.

   You use the DName value when enabling SSL.

   The DName value is used as a command line parameter for creating the **server.jks** keystore.

37. **Click Next.**

The Oracle Wallet Details screen appears.

38. **Specify the ECE wallet details to store the configuration data:**
   
   **(Optional)** In the **Wallet Location** field, enter the full path or browse to the directory in which you want to store the Oracle wallet for ECE.
   
   In the **Wallet Password** field, enter the password for the ECE wallet.
   
   In the **Confirm Wallet Password** field, enter the password for the ECE wallet again.

39. **Click Next.**

The ECE Notification Queue Details screen appears.
40. Enter the Java Message Service (JMS) credentials for the JMS server on which the ECE notification queue (JMS topic) is to reside.

ECE publishes notification events into this JMS queue (JMS topic), which external systems can use to obtain data for their own processing.

After you install ECE, you run a post-installation script that creates the JMS queue (JMS topic) on the server.

a. In the **Host Name** field, enter the host name of the server on which the JMS queue (JMS topic) resides.

b. In the **Port Number** field, enter the port number of the server on which the JMS topic resides.

c. In the **User Name** field, enter the user name for logging in to the server on which the JMS queue (JMS topic) resides.

d. In the **Password** field, enter the password for logging in to the server on which the JMS queue (JMS topic) resides.

e. In the **Connection Factory Name** field, enter the connection factory name used to create connections to the JMS queue (JMS topic) queue.

After installing ECE, you run an ECE post-installation script that creates the JMS queue (JMS topic) on the server. The connection factory name entered here is used by the script to create connections to the JMS queue (JMS topic).

f. In the **Topic Name** field, enter the name of the JMS queue (JMS topic) on the server to which ECE publishes notification events.

After installing ECE, you run a post-installation script that creates the JMS queue (JMS topic) on the server. The topic name entered here is the name the ECE post-installation script uses to create the JMS queue (JMS topic).

41. Click **Next**.

The ECE Notification Queue SSL Details screen appears.

42. Enter secure socket layer (SSL) information required to connect to the Java Message Service (JMS) queue to which ECE publishes notification events:

a. If you will not use SSL to encrypt communication between ECE and the JMS queue, select the **Disable SSL** option.

   If you select this option, do not enter values in the following fields.

b. In the **Keystore password** field, enter the password used to access the SSL keystore file.

c. In the **Keystore location** field, enter the full path to the SSL keystore file.

43. Click **Next**.

The Diameter Gateway Details screen appears.

44. Enter information that Diameter clients use to identify your Diameter Gateway server:

a. If you do not want Diameter Gateway to start when ECE starts, select the **Skip** option.

   If you select this option, do not enter values in the following fields.

b. In the **Origin Host** field, enter the value for the Origin-Host attribute-value pair (AVP) to be sent in the Diameter request.
This is a unique identifier that you assign your Diameter Gateway server on its host. It can be any string value.

The value set here is used by the Diameter client to identify your Diameter Gateway server as the connecting Diameter peer that is the source of the Diameter message.

For more information about how the Origin-Host AVP can be specified, refer to Internet Engineering Task Force (IETF) Network Working Group RFC 3588 (Diameter Base Protocol).

c. In the **Origin Realm** field, enter the value for the Origin-Realm AVP to be sent by the Diameter Gateway in outgoing Diameter requests.

This is the signaling realm (domain) that you assign your Diameter Gateway server.

The value set here is used by Diameter clients to identify your Diameter Gateway server as the source of the Diameter message.

For more information about how the Origin-Realm AVP can be specified, refer to Internet Engineering Task Force (IETF) Network Working Group RFC 3588 (Diameter Base Protocol).

The Diameter Gateway details you enter in this screen apply to one Diameter Gateway node instance that listens to all network interfaces for Diameter messages, which is suitable for basic testing directly after installation.

For a distributed environment, you must add Diameter Gateway node instances to your topology and configure a unique network interface for each instance after installation. See the discussion about adding Diameter Gateway nodes for online charging in "ECE Post-Installation Tasks".

45. Click **Next**.

The RADIUS Gateway Details screen appears.

46. Enter information that RADIUS clients use to identify your RADIUS Gateway server:

   a. If you do not want RADIUS Gateway to start when ECE starts, select the **Skip** option.

      If you select this option, do not enter values in the following fields.

   b. In the **Name** field, enter the name of the RADIUS Gateway instance.

   c. In the **Port** field, enter the port number assigned to RADIUS Gateway.

   d. In the **Shared Secret** field, enter the common password shared between the RADIUS Gateway server and Network Access Server (NAS). It is used by the RADIUS protocol for security.

   e. In the **Wallet Location** field, enter the path to the Oracle wallet that contains the SSL authentication and signature credentials (such as private keys, and certificates) and the root key for the RADIUS Gateway server.

The RADIUS Gateway details you enter in this screen apply to a single RADIUS Gateway instance (node) that listens to all network interfaces for RADIUS messages, which is suitable for basic testing directly after installation.

For a distributed environment, you must add RADIUS Gateway instances (nodes) to your topology and configure a unique network interface for each instance after installation. See the discussion about adding RADIUS Gateway nodes in "ECE Post-Installation Tasks".
47. Click Next.
   The Third-Party Library Details screen appears.

48. In the Directory field, enter the path or browse to the directory that contains the JAR files required by ECE.

49. Click Next.
   The Java Home Location screen appears.

50. Enter the path or browse to the directory in which the compatible version of Java is installed.

51. Click Next.
   The Installation Summary screen appears.

52. Review the selections you have made in the preceding screens, and click Install.
   The Installation Progress screen appears.

---

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

---

53. When the installation is done, click Next, the Installation Complete screen appears.

54. Click Finish to complete and exit.

The installer checks for all required software and displays errors if it detects any missing or unavailable components or if any connectivity issues occur.

For information about verifying the installation of ECE, see "Verifying the ECE Installation."

For information about ECE installer logs, see "Troubleshooting the ECE Installation."

### Installing ECE by Using the Silent Installation

Use the silent installation when you are installing ECE 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 ECE. You can generate a response file that contains the parameters and values during the ECE GUI installation.

### Creating a Response File

To create a response file:

1. Create a copy of the response file that was generated during the GUI installation. See "Installing ECE by Using the GUI Installation" 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.

---

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.

**Performing a Silent Installation**

To perform a silent installation:

1. Create a 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 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 installer JAR file. For example, the `jarfile` for installing ECE 12.0 is `ocece-12.0.0.1.0_generic.jar`.
   - `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 ocece-12.0.0.1.0_generic.jar -debug -invPtrLoc Inventory_home/oraInventory/oraInst.loc INSTALL_TYPE=Complete -responseFile /tmp/oracle.communications.ocece.ece.rsp -silent
   ```

   The installation runs silently in the background.

   The ECE installer checks for all required software and writes errors to a log file if it detects any missing or unavailable components or if any connectivity issues occur.

   For information about verifying the installation of ECE, see "Verifying the ECE Installation."

   For information about ECE installer logs, see "Troubleshooting the ECE Installation."
Next Steps

After you install ECE, perform the post-installation tasks. See "ECE Post-Installation Tasks."
Upgrading Existing ECE 12.0 Installation

This chapter describes how to upgrade the existing Oracle Communications Billing and Revenue Management Elastic Charging Engine (ECE) 12.0 installation.

In this chapter, the current ECE 12.0 patch set release running on your system is called the old release. The ECE patch set you are upgrading to is called the new release.

When upgrading the existing ECE installation, note the following:

- A direct upgrade from the ECE 11.1 or ECE 11.2 release is not supported.
- You must upgrade to ECE 12.0 to upgrade to ECE 12.0 Patch Set 2.
- The ECE Installer installs the complete ECE software and copies the configuration files to the new complete installation to match your existing ECE 12.0 patch set settings.

Overview of Upgrading Existing ECE 12.0 Installation

If you have an existing installation of ECE integrated with Oracle Communications Billing and Revenue Management (BRM) and Pricing Design Center (PDC) and you are upgrading that installation, do the following:

---

**Important:** Ensure that you install the following in the following order:

1. The ECE patch set.
2. A compatible version of BRM.
3. A compatible version of PDC.

See BRM Compatibility Matrix for the compatible version of BRM and PDC.

---

1. Plan your installation. See "About Planning Your ECE Installation" for more information.
2. Review system requirements. See BRM Compatibility Matrix for more information.
3. Perform the pre-upgrade tasks. See "Performing the Pre-Upgrade Tasks".
4. Perform the upgrade tasks. See "Performing the Upgrade Tasks".
5. Perform the post-upgrade tasks. See "Performing the Post-Upgrade Tasks".
Performing Zero Downtime Upgrade

If you have created an active-hot standby disaster recovery system, you can use the zero downtime upgrade method to upgrade the existing ECE installation with very minimal disruption to the existing installation and the services that are provided to your customers.

For more information on creating an active-hot standby disaster recovery system, see the discussion about configuring ECE for disaster recovery in BRM System Administrator’s Guide.

Before you perform the zero downtime upgrade, ensure the following:

- You have the same instances of ECE 12.0, BRM 12.0 patch set, and PDC 12.0 patch set installed in your production and backup sites.
- Both the instances of ECE, BRM, and PDC installed in your production and backup sites and all the components connected to your ECE system are currently running.

To perform the zero downtime upgrade:

1. Ensure that all the requests and updates (such as usage requests, top-up requests, and pricing and customer data updates) are routed to your production site.

2. In your backup site, do the following:
   - Stop the BRM and PDC instances.
   - Upgrade the BRM instance to the version compatible with your new release.
     See BRM Compatibility Matrix for the compatible BRM version and the corresponding BRM 12.0 Patch Set Installation Guide for installing BRM using the zero downtime upgrade method.
   - Upgrade the PDC instance to the version compatible with your new release.
     See BRM Compatibility Matrix for the compatible PDC version and PDC Installation Guide for installing PDC.
   - Stop replicating the ECE cache data to your production site by running the following command:
     \[ \text{gridSync stop [ProductionClusterName]} \]
     where \text{ProductionClusterName} is the name of the ECE cluster in your production site.

3. In your production site, do the following:
   - Stop replicating the ECE cache data to your backup site by running the following command:
     \[ \text{gridSync stop [BackupClusterName]} \]
     where \text{BackupClusterName} is the name of the ECE cluster in your backup site.
   - Verify that the ECE and BRM data updates are synchronized in real time and all the rated events are getting published to the persistence database or Oracle NoSQL database.

4. In your backup site, do the following:
   - Start the BRM and PDC instances and their processes.
Performing the Pre-Upgrade Tasks

This section provides instructions for ECE pre-upgrade tasks.

Backing Up Your Existing Configuration

Back up your existing configuration and installation area (the ECE installation directory and its content: ECE_home). In particular, make sure you back up all customized files.
Creating the Home Directory for the New Release

Create a directory to be the new ECE 12.0 patch set home directory, ECE_New_home; for example, ECE_120PS2. Because you have your old release on the same driver machine, be careful to specify the home details for the new release when you run the ECE 12.0 patch set Installer. The home details consist of the home directory path and a unique name you give to the new installation.

When you run the Installer, it displays the home details of any old release installations it detects on your driver machine in the Specify Home Details list.

Performing the Upgrade Tasks

This section provides instructions for ECE upgrade tasks.

Obtaining the ECE 12.0 Patch Set Software

To obtain ECE 12.0 Patch Set software:
1. Create a temporary directory (temp_dir).
2. Go to the My Oracle Support Web site:
   http://support.oracle.com
3. Sign in with your user name and password.
4. Click the Patches & Updates tab.
5. From the list, select Patch Name or Number.
6. In the text field, enter the PatchNumber and click Search.
   where PatchNumber for ECE 12.0 Patch Set 2 is 30094507.
   The Patch Search Results page appears.
7. Click the patch name.
   The patch details appear.
8. From the Platform list, select the platform and click Download.
   The File Download dialog box appears.
9. Download the PatchNumber_PatchSet_platform.zip software pack to temp_dir.
   where:
   ■ PatchSet is 120020.
   ■ platform is linux or solaris.
10. Unzip PatchNumber_PatchSet_platform.zip and extract the contents to temp_dir.
    The extracted software pack has the following structure:
        ocece/Disk1/install
        ocece/Disk1/stage

Important: Store this backup in a safe location. The data in these files are necessary if you encounter any issues in the installation process.
Performing the Upgrade Tasks

Upgrading Existing ECE 12.0 Installation

6-5

Installing the ECE 12.0 Patch Set for Your Upgrade

Install the ECE 12.0 patch set using the Patchset installer type into ECE New home.

Follow the instructions in "Installing Elastic Charging Engine" to install ECE using the Patchset installer type.

In the Existing ocece Installation Details screen, ensure that you enter the full path or browse to the directory in which you installed the existing ECE installation.

Reconfiguring Configuration File Settings to Match Your Old Release

After installing the new patch set, reconfigure the default system and business configuration files of the new installation to match the settings in your old release configuration files.

Reconfigure all settings in the files of the following directories to match your old installation settings:
- ECE New home/occeserver/
- ECE New home/occeserver/config
- ECE New home/occeserver/brm_config

You must move the configuration data, such as your custom customer profile data and request specification files, into ECE New home.

You can also use a merge tool to merge the configuration files you have changed in your old installation with the configuration files in the new installation.

---

**Important:** Do not use a merge tool for reconfiguring the settings in the ECE home/occeserver/config/management/charging-settings.xml file. New and changed properties can be introduced in this file, which would make the file difficult to merge.

---

To reconfigure settings of the ECE New home/config/management/charging-settings.xml file:

1. On the driver machine, Open the ECE New home/occeserver/config/ectopology.conf file.

2. For each physical server machine or unique IP address in the cluster, enable charging server nodes (such as the ecs1 node) for JMX management by specifying a port for each node and setting it to start CohMgt = true.

---

**Important:** Do not specify the same port for the JMX management service that is used by your old ECE installation. Enable charging server nodes on your new installation for JMX management by using unique port numbers.

---

3. Save and close the file.

4. Start the JMX-management-enabled charging server nodes by doing the following:
   a. Change directory to the ECE New home/occeserver/bin directory.
   b. Start Elastic Charging Controller (ECC):
      
      ```bash
      ./ecc
      ```
Performing the Upgrade Tasks

5. Access the ECE MBeans:
   a. Log on to the driver machine.
   b. Start a JMX editor, such as JConsole, that enables you to edit MBean attributes.
   c. Connect to the ECE charging server node set to `start CohMgt = true` in the `ECE_New_home/oceceserver/config/eceTopology.conf` file.
      The `eceTopology.conf` file also contains the host name and port number for the node.
   d. In the editor’s MBean hierarchy, expand the ECE Configuration node.

6. Use the JMX editor to enter values for all settings associated with your old release’s `ECE_home/config/management/charging-settings.xml` file and enter values for new settings introduced in the new release.
   Your configurations are saved to the `ECE_New_home/oceceserver/config/management/charging-settings.xml` file.

7. Stop the JMX-management-enabled charging server nodes.

Copying the Mediation Specification File to the New Installation

When installing the new release, the mediation specification file is not automatically copied to the new installation.

You must manually copy the mediation specification file (for example, `diameter_mediation.spec`) in your old release’s `ECE_home/oceceserver/config/management` directory to the new installation.

For information about the mediation specification file, see BRM Elastic Charging Engine Implementation Guide.

Upgrading Extension Code

If you customized rating by implementing extensions using the ECE extensions interface, apply the customizations to the corresponding files of the new installation.

Upgrade your extension code and recompile it. Recompile `ECE_home/oceceserver/config/extensions` with the new library. Ensure that the packaged extensions JAR files are available to the ECE runtime environment in the `ECE_home/lib` folder.

Verifying the New Parameters in the Upgraded ECE Configuration Files

The upgrade process automatically adds or updates parameters in the following configuration files:

- **JMSConfiguration.xml**: The following JMSDestination name sections in this configuration file are updated or added:
  - `NotificationQueue`: New parameters read by the ECE charging nodes.
  - `BRMGatewayNotificationQueue`: New section read by BRM Gateway.
  - `DiameterGatewayNotificationQueue`: New section read by Diameter Gateway.
Performing the Upgrade Tasks

- **migration-configuration.xml**: The **pricingUpdater** section in this configuration file is updated.

Perform the following procedures to verify that the new parameters were successfully added to the configuration files and that the default values of the new and updated parameters are appropriate for your system. If necessary, change the values.

- Verifying New and Updated Parameters in the Upgraded JMSConfiguration.xml File
- Verifying New and Updated Parameters in the Upgraded migration-configuration.xml File

**Verifying New and Updated Parameters in the Upgraded JMSConfiguration.xml File**

To verify the new and updated parameters in the upgraded JMSConfiguration.xml file:

1. Open the `ECE_New_home/config/JMSConfiguration.xml` file in a text editor.
2. Locate the `<MessagesConfigurations>` section and its three **JMSDestination** name sections.
3. In each **JMSDestination name** section, verify that the values of the following parameters are appropriate for your system:

   ```xml
   <JMSDestination name="JMS_destination_name">
     <HostName>host_name</HostName>
     <Port>port_number</Port>
     <UserName>user_name</UserName>
     <Password>password</Password>
     <ConnectionFactory>connection_factory_name</ConnectionFactory>
     <QueueName>queue_name</QueueName>
     <SuspenseQueueName>suspense_queue_name</SuspenseQueueName>
     <Protocol>protocol</Protocol>
     <ConnectionURL>connection_URL</ConnectionURL>
     <ConnectionRetryCount>connection_retry_count</ConnectionRetryCount>
     <ConnectionRetrySleepInterval>connection_retry_sleep_interval</ConnectionRetrySleepInterval>
     <InitialContextFactory>initial_context_factory_name</InitialContextFactory>
     <RequestTimeOut>request_timeout</RequestTimeOut>
     <KeyStorePassword>keystore_password</KeyStorePassword>
     <keyStoreLocation>keystore_location</keyStoreLocation>
   </JMSDestination>
   
   where:
   
   - **JMS_destination_name** is one of the following names:
     - NotificationQueue
     - BRMGatewayNotificationQueue
     - DiameterGatewayNotificationQueue
   
   **Note**: Do not change the value of the **JMSDestination name** parameters.

- **host_name** specifies the name of a WebLogic server on which a JMS topic resides.
If you provided a value for the **HostName** field on the ECE Notification Queue Details installer screen, that value appears here. Add this host to the **ConnectionURL** parameter, which takes precedence over **HostName**.

- **port_number** specifies the port number on which the WebLogic server resides.

If you provided a value for the **Port Number** field on the ECE Notification Queue Details installer screen, that value appears here. Add this port number to the **ConnectionURL** parameter, which takes precedence over **Port**.

- **user_name** specifies the user for logging on to the WebLogic server.

This user must have write privileges for the JMS topic.

- **password** specifies the password for logging on to the WebLogic server.

When you install ECE, the password you enter is encrypted and stored in the keystore. If you change the password, you must run a utility to encrypt the new password before entering it here. See the discussion about encrypting new passwords in **BRM System Administrator’s Guide**.

- **connection_factory_name** specifies the connection factory used to create connections to the JMS topic on the WebLogic server to which ECE publishes notification events.

You must also configure settings in Oracle WebLogic Server for the connection factory. For more information, see the discussion about configuring a WebLogic Server connection factory for a JMS topic.

- **queue_name** specifies the JMS topic that holds the published external notification messages.

- **suspense_queue_name** specifies the name of the queue that holds failed updates sent through the BRM Gateway. This parameter is applicable only for the **BRMGatewayNotificationQueue** section.

- **protocol** specifies the wire protocol used by your WebLogic servers in the **ConnectionURL** parameter, which takes precedence over **Protocol**. The default is `t3`.

- **connection_URL** lists all the URLs that applications can use to connect to the JMS WebLogic servers on which your ECE notification queue (JMS topic) or queues reside.

**Note:**

- When this parameter contains values, it takes precedence over the deprecated **HostName**, **Port**, and **Protocol** parameters.

- If multiple URLs are specified for a high-availability configuration, an application randomly selects one URL and then tries the others until one succeeds.

Use the following URL syntax:

```
[t3|t3s|http|https|iiop|iiops]://address[,address] . . .
```

where:

- `t3`, `t3s`, `http`, `https`, `iiop`, or `iiops` is the wire protocol used.

For a WebLogic server, use `t3`. 
Performing the Upgrade Tasks

Upgrading Existing ECE 12.0 Installation

– address is hostlist:portlist.
– hostlist is hostname,hostname.
– hostname is the name of a WebLogic server on which a JMS topic resides.
– portlist is portrange, portrange.
– portrange is port, port.
– port is the port number on which the WebLogic server resides.

Examples:
t3://hostA:7001
t3://hostA,hostB:7001-7002

The preceding URL is equivalent to all the following URLs:
t3://hostA,hostB:7001+7002
t3://hostA:7001-7002,hostB:7001-7002
t3://hostA:7001+7002,hostB:7001+7002
t3://hostA:7001,hostA:7002,hostB:7001,hostB:7002

• connection_retry_count specifies the number of times a connection is retried after it fails. The default is 10.
  This applies only to clients that receive notifications from BRM.
• connection_retry_sleep_interval specifies the number of milliseconds between connection retry attempts. The default is 10000.
• initial_context_factory_name specifies the name of the initial connection factory used to create connections to the JMS topic queue on each WebLogic server to which ECE will publish notification events.
• request_timeout specifies the number of milliseconds in which requests to the WebLogic server must be completed before the operation times out. The default is 3000.
• keystore_password specifies the password used to access the SSL keystore file if SSL is used to secure the ECE JMS queue connection.
• keystore_location specifies the full path to the SSL keystore file if SSL is used to secure the ECE JMS queue connection.

4. Save and close the file.

For more information about these parameters, see the discussion about configuring JMS credentials for publishing external notifications in the ECE Implementation Guide.

Verifying New and Updated Parameters in the Upgraded migration-configuration.xml File

To verify the new and updated parameters in the upgraded migration-configuration.xml file:

1. Open the ECE_New_home/occeserver/config/management/migration-configuration.xml file.
2. Locate the pricingUpdater section.
3. Verify that the default values of the following parameters are appropriate for your system:

   <pricingUpdater
Performing the Upgrade Tasks

...%20hostName="host_name"
port="port_number"
...%20connectionURL="connection_URL"
connectionRetryCount="connection_retry_count"
connectionRetrySleepInterval="connection_retry_sleep_interval"
...%20protocol="protocol"
...%20requestTimeOut="request_timeout"
...
</pricingUpdater>

where:

- **host_name** specifies the name of the server on which a JMS queue to which
PDC publishes pricing data resides.

  If you provided a value for the Host Name field on the PDC Pricing
Components Queue Details installer screen, that value appears here. Add this
host to the ConnectionURL parameter, which takes precedence over
HostName.

- **port_number** specifies the port number of the server on which the PDC JMS
queue resides.

  If you provided a value for the Port Number field on the PDC Pricing
Components Queue Details installer screen, that value appears here. Add this
port number to the ConnectionURL parameter, which takes precedence over
Port.

- **connection_URL** lists all the URLs that applications can use to connect to the
servers on which the PDC JMS queue or queues reside.

---

**Note:**

- When this parameter contains values, it takes precedence over the
deprecated **hostName**, **port**, and **protocol** parameters.

- If multiple URLs are specified for a high-availability
configuration, an application randomly selects one URL and then
tries the others until one succeeds.

---

Use the following URL syntax:

```
[t3|t3s|http|https|iiop|iiops]://address[,address]...
```

where:

- **t3, t3s, http, https, iiop, or iiops** is the wire protocol used.
  - For a WebLogic server, use **t3**.
  - **address** is **hostlist:portlist**.
  - **hostlist** is **hostname[hostname]**.
  - **hostname** is the name of a server on which a PDC JMS queue resides.
  - **portlist** is **portrange[+portrange]**.
  - **portrange** is **port[-port]**.
Performing the Post-Upgrade Tasks

Upgrading Existing ECE 12.0 Installation

– port is the port number of the server on which the PDC JMS queue resides.

Examples:

t3://hostA:7001

t3://hostA,hostB:7001-7002

The preceding URL is equivalent to all the following URLs:

t3://hostA,hostB:7001+7002

t3://hostA:7001-7002,hostB:7001-7002

t3://hostA:7001+7002,hostB:7001+7002

t3://hostA:7001,hostA:7002,hostB:7001,hostB:7002

■ connection_retry_count specifies the number of times a connection is retried after it fails. The default is 10.

This applies only to clients that receive notifications from BRM.

■ connection_retry_sleep_interval specifies the number of milliseconds between connection retry attempts. The default is 10000.

■ protocol specifies the wire protocol used by the servers listed in the ConnectionURL parameter, which takes precedence over Protocol. The default is t3.

■ request_timeout specifies the number of milliseconds in which requests to the PDC JMS queue server must be completed before the operation times out. The default is 3000.

4. Save and close the file.

Performing the Post-Upgrade Tasks

This section provides instructions for ECE post-upgrade tasks.

Deploying the Patch Set Onto Server Machines

If you installed an ECE standalone installation, you can skip this task.

Deploying the patch set onto the server machines means that you distribute the Elastic Charging Server node instances (charging server nodes) and other nodes defined in your topology file across the server machines.

To deploy the patch set onto your server machines:

1. Open the ECE_New_home/config/eceTopology.conf file and your old release topology file.

2. Verify the following:

   a. The settings in the ECE_New_home/config/eceTopology.conf file are the same as specified in your old release topology file.

      Your topology configuration must be identical to that of your old installation. Oracle recommends that you copy the topology file from your old installation.

   b. All the hosts included in the ECE_New_home/config/eceTopology.conf file have the same login ID (user ID) and the password-less SSH has been configured to all hosts from the driver machine.

3. Save and close the files.
Performing the Post-Upgrade Tasks

4. Verify that all of the custom files and system and business configuration files of the new installation match the settings of your old installation configuration files and that your custom request specification files and custom customer profile data is being carried over.

5. Open the `ECE_New_home/config/management/migration-configuration.xml` file.

6. Verify that the `configObjectsDataDirectory` parameter is set to the directory where you store your configuration data (mediation specification used by Diameter Gateway).

7. Save and close the file.

8. Log on to the driver machine.

9. Go to the `ECE_New_home/bin` directory.

10. Start Elastic Charging Controller (ECC):
    
    `./ecc`

11. Run the following command, which deploys the ECE installation onto server machines:
    
    `sync`

    The `sync` command copies the relevant files of the ECE installation onto the server machines in the ECE cluster.

Performing a Rolling Upgrade

**Important:** Rolling upgrade is supported only if ECE Persistence is disabled.

If ECE persistence is enabled, you must stop all ECE nodes of your existing installation, restore your ECE system, and then start all ECE nodes of your existing installation. For more information, see "Stopping and Restoring Your ECE System".

Rolling upgrades will gracefully shut down processes of the old ECE installation and start up the processes of the new installation while maintaining operation of the overall ECE system.

Rolling upgrades are intended for production systems to prevent interruption of service for customers during the upgrade. Rolling upgrades are also useful for test systems to avoid tedious restarts of ECE charging server nodes that would require reloading data from BRM and PDC to re-prime ECE caches.

To perform a rolling upgrade:
Performing the Post-Upgrade Tasks

Upgrading Existing ECE 12.0 Installation

1. Ensure that you deploy the new release onto server machines. See "Deploying the Patch Set Onto Server Machines".

2. Set the parameter `rollingUpgradePauseSecondsPerNode` in `ECE_home/occeserver/config/ece.properties` file to specify the number of seconds to wait for node to startup, during rolling upgrade process.

3. Run the following command to start the rolling upgrade in the new release while ECE is still operating on the old release:

   ```
groovy:000> rollingUpgrade
   ```

   One by one, each node on the old location is brought down, upgraded, and joined back to the cluster.

   When you run the `rollingUpgrade` command with no parameters specified, all running nodes are upgraded (charging server nodes, data-loading utility nodes, data updating nodes, and so on) except for simulator nodes.

   The order in which the nodes are restarted adheres to the order in which the nodes are listed in the `ECE_New_home/config/eceTopology.conf` file.

   You can choose to upgrade nodes (bring them down, upgrade them, and join them back to the cluster) by node role. It is recommended to first upgrade all the nodes of role `ratedEventFormatter`, followed by all the nodes of role `server`, followed by all the nodes of role `updater`, and then followed lastly by all the nodes of role `diametergateway`; for example:

   ```
routingUpgrade ratedEventFormatter
   rollingUpgrade server
   rollingUpgrade updater
   rollingUpgrade diametergateway
   ```

   After the upgrade is completed, the new release is used, and you can decide what to do with the old directory installation.

   When you use the new release, verify that the path to your configuration data (the path to your custom customer profile data and request specification data) is specified correctly for where the data lives on your new release by doing the following:

---

**Caution:** (Productions systems) To mitigate charging server node failures that might threaten your system’s ability to handle your customer base:

- Schedule the rolling upgrade outside of your regular peak processing time.
- Ensure that you have appropriate number of charging server nodes for your customer base. If the minimum number of charging server nodes needed for your customer base is N, you must run at least N+1 nodes to have uninterrupted usage processing during a rolling upgrade.

---

**Tip:** Before performing the rolling upgrade, the new release must be installed in a different directory. After launching ECC using the new installation, the `rollingUpgrade` command is called to upgrade the system to the new release.
Performing the Post-Upgrade Tasks

1. Access the ECE MBeans by launching a JMX editor and entering the IP address (or host name) and port of your JMX-management-enabled charging server node on the running new release.

2. Click the MBeans tab.

3. Expand ECE Configuration.

4. Expand migration.loader.

5. In the Name column, select configObjectsDataDirectory.

6. In the Value column, enter the directory where you store your configuration data (your mediation specification files).

Your configuration is saved to the ECE_New_home/config/management/migration-configuration.xml file (do not edit this file directly).

Stopping and Restoring Your ECE System

Caution: Restarts of the ECE system are not intended for production systems. If you are upgrading a production system, perform a rolling upgrade. See "Performing a Rolling Upgrade" for information.

Restarts of the ECE system are done for test systems only when it is intended to remove all data from Coherence caches.

To restore an upgraded ECE system:

1. Stop all ECE nodes of the old ECE installation.

2. In PDC, publish all the PDC pricing data (the metadata, setup, pricing, and profile data) from the PDC database to ECE by running the following command:

   `ImportExportPricing -publish -metadata -config -pricing -profile -target [ece]`

   Running this command publishes all the metadata, setup, pricing, and profile data in the PDC database to ECE.

3. Reconfigure the ECE_New_home/config/management/charging-settings.xml file to match the settings (including customizations) in your old release and enter values for settings introduced in the new release.

4. On the driver machine, go to the ECE_New_home/bin directory.

5. Start ECC:

   `./ecc`

6. Enable real-time synchronization of BRM and ECE customer data updates. See the discussion about configuring ECE for synchronizing BRM and ECE customer data in real time in BRM Elastic Charging Engine Implementation Guide for more information.

7. Start ECE processes and gateways in the following order:

   Important: Depending on your installation, you start Diameter Gateway, RADIUS Gateway, or both.
start server
start configLoader
start pricingUpdater
start customerUpdater
start emGateway
start brmGateway
start ratedEventFormatter
start diameterGateway
start radiusGateway

All data is now back in the ECE data grid.
Real-time-data updates, which had been temporarily disrupted due to the shutdown, are processed upon restart.

**Verifying the Installation After the Upgrade**

**Note:** Test the patch set that you installed on a non-production system with a copy of your production data before you deploy it on a production system.

Verify the ECE installation by starting the ECE nodes in the cluster, loading the data needed for rating, and generating usage to verify that usage requests can be processed and customer balances can be impacted.

See "Verifying the ECE Installation" for information about verifying the ECE installation.
Verifying the Installation After the Upgrade
This chapter provides instructions for Oracle Communications Billing and Revenue Management Elastic Charging Engine (ECE) post-installation tasks. You must install or upgrade ECE before following these procedures. See “Installing Elastic Charging Engine”.

Overview of ECE Post-Installation Tasks

After installing or upgrading ECE, you must perform certain tasks. Some tasks you only need to perform for an ECE integrated installation. See the following topics for the post-installation tasks:

- Post-Installation Tasks Common to All ECE Installations
- Post-Installation Tasks for an ECE Integrated Installation
- Post-Installation Tasks for ECE Software Upgrade

Post-Installation Tasks Common to All ECE Installations

This section describes the post-installation tasks you must perform that are common to all ECE installations.

Specifying Driver Machine Properties

The driver machine is the machine on which you installed ECE, and it is the machine used to administer the ECE system. You specify the driver machine properties in the ece.properties file.

If you installed an ECE standalone installation, you must add an entry to the properties file that specifies that Oracle Communications Billing and Revenue Management (BRM) is not installed; if you do not, ECE tries to load BRM update events and cannot transition into a usage processing state.

To specify the ECE driver machine properties:

1. Open the $ECE_HOME/oceceserver/config/ece.properties file.
2. Specify the driver machine:
   - For a standalone installation, set the `driverIP` parameter either to `localhost` or to the explicit IP address or hostname of the machine. For example:
     \[ \text{driverIP} = \text{localhost} \]
   - For an ECE system that has more than one machine, set `driverIP` to the explicit IP address value of the driver machine.
3. (ECE standalone installation) Specify that BRM is not installed by adding the following entry:

```
java.property.skipBackLogProcessing=true
```

4. For an ECE system that has more than one machine, specify that configuration settings of a secondary machine should not be loaded into the driver machine by adding the following entry:

```
loadConfigSettings = false
```

5. Save and close the file.

### Specifying Server Machine Properties

You specify server machine properties to configure your ECE topology and tune the nodes in the cluster for garbage collection and heap size.

When you configure your ECE topology, you specify the ECE nodes in the cluster. This includes the physical host machines, or server machines, on which to deploy ECE nodes and the nodes themselves. Each server machine is a part of the Coherence cluster.

For an ECE standalone installation, you can accept all default values in the topology file if desired. You can add any number of charging server nodes (nodes that have the role server specified) and modify or delete existing charging server nodes. You must have at least one charging server node.

---

**Note:** The topology file is pre-configured with several nodes that are required by ECE. Do not delete existing rows in this file.

---

To specify server machine properties:

1. Open the `ECE_home/oceceserver/config/eceTopology.conf` file.

2. Add a row for each Coherence node for each physical host computer (server machine) in the cluster.

   For example, if you have three physical server machines and each physical server machine has three nodes, you require nine rows.

3. For each row, enter the following information:
   - Name of the JVM process for that node.
     You can assign an arbitrary name. This name is used to distinguish processes that have the same role.
   - Role of the JVM process for that node.
     Each node in the ECE cluster plays a certain role.
   - Host name of the physical server machine on which the node resides.
     For a standalone system, enter **localhost**.
     A standalone system means that all ECE-related processes are running on a single physical server machine.
   - (For multihomed hosts) IP address of the server machine on which the node resides.
     For those hosts that have multiple IP addresses, enter the IP address so that Coherence can be pointed to a port.
Post-Installation Tasks Common to All ECE Installations

- Whether you want the node to be JMX-management enabled.
  See "Enabling Charging Server Nodes for JMX Management".
- The JVM tuning file that contains the tuning profile for that node.

4. (For Diameter Gateway nodes) For one Diameter Gateway node, specify a JMX port.
   Choose a port number that is not in use by another application.
   By specifying a JMX port number for one Diameter Gateway node, you expose MBeans for setting performance-related properties and collecting statistics for all Diameter Gateway node processes.

5. (For SDK sample programs) To run the SDK sample programs by using the `sdkCustomerLoader`, uncomment the line where the `sdkCustomerLoader` node is defined.

6. Save the file.
   You must specify the JVM tuning parameters (the number of threads, memory, and heap size) for each Coherence node that you specified in the `eceTopology.conf` file by editing or creating the JVM tuning file(s).

7. Open the `ECE_home/oceceserver/config/defaultTuningProfile.properties` file.
   You can create your own JVM tuning file and save it in this directory. You can name the file what you want.

8. Set the parameters as needed.

9. Save the file.

10. In the topology file (`ECE_home/oceceserver/config/eceTopology.conf`), ensure your JVM tuning file is associated with the node to which you want the tuning profile (as set by these parameters) to apply.
    The JVM tuning file is referenced by name in the topology file as mentioned earlier in this procedure.

### Enabling Charging Server Nodes for JMX Management

After installing ECE, you may reset system configurations, such as connection parameters for connecting to other applications, and set business configurations, such as charging-related rules you want to apply at run time. To set most configuration parameters, you use a JMX editor such as JConsole. Before you can use a JMX editor to set configuration parameters, you must expose ECE MBeans. You expose ECE MBeans by enabling one ECE node for JMX management for each unique IP address in your topology. When a JMX-management-enabled node starts, it provides a JMX management service on the specified host and port which is used to expose the ECE configuration MBeans.

Though any ECE node can be enabled for JMX management, you enable charging-server nodes for JMX management to support central configuration of the ECE system. Charging-server nodes are always running, and enabling them for JMX management exposes MBeans for all ECE node processes (such as Diameter Gateway node instances, simulators, and data loaders).

To enable a charging server node for JMX management:

1. Open the `ECE_home/oceceserver/config/eceTopology.conf` file.
2. For each physical server machine or unique IP address in the cluster, provide the following information for one charging server node (node with role server):

- JMX port of the JVM process for that node.
  
  Enter any free port, such as 9999, for the charging server node to be the JMX-management enabled node.
  
  Choose a port number that is not in use by another application.
  
  The default port number is 9999.

- Specify that you want the node to be JMX-management enabled by entering true in the start CohMgt column.
  
  For charging server nodes (nodes with the role server), always enable JMX-management for the node for which a JMX port is supplied.
  
  Enable only one charging server node per physical server for JMX management.
  
  Because multiple charging server nodes are running on a single physical machine, you set CohMgt=true for only one charging server node on each physical machine. Each machine must have one charging server node with CohMgt=true for centralized configuration of ECE to work.

3. Save the file.

Configuring ECE for Multicast or Unicast

This section describes how to configure ECE for multicast or unicast. Oracle Coherence uses the TCMP protocol, which can use the UDP/IP multicast or UDP/IP unicast methods of data transmission over the network. See the discussion about network protocols in Oracle Coherence Getting Started Guide for detailed information about how Oracle Coherence uses the TCMP protocol.

When ECE is deployed in a distributed environment (multiple machines), it uses multicast or unicast for discovering other nodes when forming a cluster; for example, for allowing a newly started node to discover a pre-existing cluster. Multicast is preferred because it allows packets to be sent only one time rather than sending one packet for each node. Multicast can be used only if it is enabled in the operating system and the network.

To configure ECE for multicast or unicast, see the following topics:

- To test that multicast is enabled in the operating system, see "Determining Whether Multicast Is Enabled".
- To configure ECE when using multicast, see "Configuring ECE for Multicast".
- To configure ECE when not using multicast, see "Configuring ECE for Unicast".

Determining Whether Multicast Is Enabled

To determine whether multicast is enabled in the operating system, use the Oracle Coherence multicast test utility. See the discussion about performing a multicast connectivity test in Oracle Coherence Administrator’s Guide for detailed information about using the multicast test utility and how to understand the output of the test:

http://docs.oracle.com/cd/E18686_01/coh.37/e18679/tune_multigramtest.htm

To determine whether multicast is enabled in the operating system, go to the directory where the multicast-test.sh script is located and use the following test.
You can use the following tests to determine if multicast is enabled in the network. Start the test on Machine A and Machine B by entering the following command into the respective command window of each and pressing ENTER:

```
Machine A $ ./multicast-test.sh -ttl 1
Machine B $ ./multicast-test.sh -ttl 1
```

If multicast across Machine A and Machine B is not working with a TTL (time to live) setting of 1, repeat this test with the default TTL setting of 4. A TTL setting of 4 is required when the machines are not on the same subnet. If all participating machines are connected to the same switch, and therefore in the same subnet, use the TTL setting of 1.

If Machine A and Machine B both have multicast enabled in the environment, the test output for each machine will show the machine issuing multicast packets and seeing both its own packets as well as the packets of the other machine. This indicates that multicast is functioning properly between the machines.

**Configuring ECE for Multicast**

To configure ECE when using multicast:

1. Verify the TTL value you must use in your environment.
   
   See "Determining Whether Multicast Is Enabled".

2. Open the ECE Coherence override file your ECE system uses (for example, `ECE_home/oceceserver/config/charging-coherence-override-prod.xml`).
   
   To confirm which ECE Coherence override file is used, refer to the `tangosol.coherence.override` parameter of the `ECE_home/oceceserver/config/ece.properties` file.

   **Tip:** When using multicast, using `charging-coherence-override-prod.xml` enables multicast across multiple computers within a single sub-network.

3. In the `multicast-listener` section, update the `tangosol.coherence.ttl` parameter to match the TTL value you must use in your environment.

   For example, to set a TTL value of 4:

   ```xml
   <multicast-listener>
     <address system-property="tangosol.coherence.clusteraddress">ip_address</address>
     <port system-property="tangosol.coherence.clusterport">port</port>
     <time-to-live system-property="tangosol.coherence.ttl">4</time-to-live>
   </multicast-listener>
   ```

   **Note:** You can segregate multiple ECE clusters within the same subnet by assigning distinct `tangosol.coherence.clusteraddress` values for each cluster.

4. Save the file.
**Configuring ECE for Unicast**

If multicast is not used, you must set up the Well Known Addresses (WKA) mechanism for your ECE cluster. Configuring a list of well known addresses prevents Coherence from using multicast.

To configure ECE when not using multicast:

1. Open the ECE Coherence override file your ECE system uses (for example, `ECE_home/occeserver/config/charging-coherence-override-prod.xml`).

   To confirm which ECE Coherence override file is used, refer to the `tangosol.coherence.override` parameter of the `ECE_home/occeserver/config/ece.properties` file.

2. Comment out the `multicast-listener` section.

3. Add the following `unicast-listener` section to the file:

   ```xml
   <unicast-listener>
   <well-known-addresses>
   <socket-address id="id">
   <address system-propety="tangosol.coherence.wka">ip_address</address>
   <port system-property="tangosol.coherence.wka.port">port</port>
   </socket-address>
   ...
   <well-known-addresses>
   <port system-property="tangosol.coherence.localport">port</port>
   </unicast-listener>
   ```

   where:
   - `id` is the ID for a particular cluster member
   - "tangosol.coherence.wka" must refer to the machine that runs the first Elastic Charging Server node (the `ecs1` charging server node).
   - `ip_address` is the IP address of the cluster member
   - `port` is the value specified in the member’s unicast listener port

4. Save the file.

**Adding and Configuring Diameter Gateway Nodes for Online Charging**

During ECE installation, if you specified that Diameter Gateway must be started when ECE is started, the ECE Installer creates a single instance (node) of Diameter Gateway (`diameterGateway1`) that is added to your topology. By default, this instance listens to all network interfaces for Diameter messages.

For a standalone installation, a single node is sufficient for basic testing directly after installation; for example, to test if the Diameter client can send a Diameter request to the Diameter Gateway node. Add additional Diameter Gateway nodes to your topology, configure them to listen on the different network interfaces in your environment, and perform performance testing. For information on adding and configuring Diameter Gateway nodes, see BRM System Administrator’s Guide.

---

**Important:** When configuring additional Diameter Gateway nodes, ensure that you configure the Diameter peers and alternative peers for routing notifications. See the discussion about configuring alternative Diameter peers for notifications in BRM ECE Implementing Charging for more information.
Adding and Configuring RADIUS Gateway Nodes for Authentication and Accounting

During ECE installation, if you specified that RADIUS Gateway must be started when ECE is started, the ECE Installer creates a single instance (node) of RADIUS Gateway (radiusGateway1) that is added to your topology. By default, this instance listens to RADIUS messages.

For a standalone installation, a single node is sufficient for basic testing directly after installation; for example, to test if the RADIUS client can send a RADIUS request to the RADIUS Gateway node. Add additional RADIUS Gateway nodes to your topology and configure them to listen on the different network interfaces in your environment. For information on adding and configuring RADIUS Gateway nodes, see *BRM System Administrator’s Guide*.

Configuring Default System Currency

During rating, ECE uses the subscriber’s primary currency or the secondary currency for charging subscribers. If the currency used in the rate plans does not match the subscriber’s primary or secondary currency, ECE uses the default system currency, US dollars.

For more information, see the discussion about configuring default system currency in *BRM System Administrator’s Guide*.

Configuring Headers for External Notifications

To identify and process external notifications, you must configure a header for each external notification. See the discussion about configuring headers for external notifications in *BRM ECE Implementing Charging* for more information.

Deploying ECE onto Server Machines

If you installed an ECE standalone installation on a single machine only, you can skip this task.

If your ECE cluster includes multiple physical server machines, you run the ECE sync command to deploy ECE from the driver machine onto the server machines in the cluster.

Deploying ECE onto the server machines (in your distributed environment) means that you distribute the Elastic Charging Server node instances (charging server nodes) and other nodes defined in your topology file across the server machines.

**Tip:** For the sync command to work as expected, all the hosts included in the eceTopoLogy.conf file must have the same login ID (user ID) and from the driver machine password-less SSH must be configured to all hosts.

To deploy ECE onto server machines:

1. Log on to the driver machine.
2. Change directory to the ECE_home/occeserver/bin directory:
3. Start Elastic Charging Controller (ECC):
   
   ./ecc
4. Deploy the ECE installation onto server machines:
   
   sync
The `sync` command copies the relevant files of the ECE installation onto the server machines you have defined to be part of the ECE cluster.

## Post-Installation Tasks for an ECE Integrated Installation

For an ECE integrated installation, you perform the post-installation tasks common to all ECE installations and also the tasks described in this section. See "Post-Installation Tasks Common to All ECE Installations" for information on common post-installation tasks.

For an integrated installation, after you install ECE, you must do the following:

1. Create the following required queues for BRM and Pricing Design Center (PDC):
   - Suspense queue
     See the BRM System Administrator’s Guide for the discussion on configuring the suspense queue.
   - Acknowledgement queue
   - ECE notification queue (JMS topic)
     Set up an ECE notification queue on a server running Oracle WebLogic Server where ECE can publish notification events for consumption by external systems, such as Oracle Communications Offline Mediation Controller. The ECE notification queue is a JMS topic; it can be on the same WebLogic server as the JMS queue where PDC publishes pricing updates.
     See the discussion in the Oracle WebLogic Server documentation for information about setting up JMS queues.
     If you set up multiple JMS WebLogic servers for failover, you must enter their connection information in the `ECE_home/oceceserver/config/JMSConfiguration.xml` file. See "Configuring Credentials for Multiple JMS WebLogic Servers."
     See the discussion about configuring notifications for charging in BRM ECE Implementing Charging for more information about configuring the ECE notification queue.
     For instructions on creating these queues, see "Creating Required Queues for BRM".
   2. Install and configure your network mediation software. For example:
      - If you use Diameter Gateway as your network integration for online charging, ensure that you have added and configured Diameter Gateway nodes to listen on the different network interfaces in your environment. See "Adding and Configuring Diameter Gateway Nodes for Online Charging" for more information.
      - If you use Offline Mediation Controller as network mediation software for offline charging, see Oracle Communications Offline Mediation Controller Elastic Charging Engine Cartridge Pack User Guide for instructions on installing and configuring Offline Mediation Controller to access ECE SDK libraries and send usage requests for offline CDRs.
   3. Enable secure communication between components in the ECE integrated installation. See the following topics for more information:
      - Generating Java Keystore Certificates
Creating Required Queues for BRM

Use the post_Install.pl script to create the required BRM queues: suspense queue, acknowledgement queue, and JMS notification queue.

**Location**

`ECE_home/occeserver/post_installation/

**Syntax**

`perl post_Install.pl`

You are prompted to install the BRM suspense and acknowledgement queues and the JMS notification queue. You can choose to install one, two, or all the queues.

The queue names are specified during the ECE installation process and are used by the post installation script.

If queues are already created, you see a message in the log files. Alternatively, you can check if the BRM queues exist by querying the `user_queues` table on your BRM machine. If the suspense and acknowledgement queues are already created, a note will be logged in `brm_queue.log`. If the JMS notification queue is already created, a note will be logged in `output.log`.

**Parameters**

For the BRM suspense and acknowledgement queues, you also need to enter the BRM machine password in addition to entering the following parameters:

- **BRM_HOSTNAME**: The IP address or the host name of the computer on which the BRM database is configured.
- **BRM_USER**: The BRM database schema user name.
- **BRM_DB_PASSWORD**: The password for the BRM database user.

For the JMS ECE notification queue, you enter the following WebLogic server parameters:

- **JMS_PASSWORD**: The password for logging on to the WebLogic server on which the JMS queue resides.
- **JMS_MODULE_NAME**: The JMS system module name of the module that has already been created on the WebLogic server.
- **JMS_SUBDEPLOYMENT**: The name of the subdeployment target in the JMS system module that has already been created on the WebLogic server.

After the JMS ECE notification queue is created, do the following in the WebLogic server:

1. Log on to the WebLogic Server on which the JMS topic for the ECE notification queue resides.
2. In the WebLogic Server Administration Console, from the JMS modules list, select the connection factory that applies to the JMS topic.
3. In the Client tab, do the following:
   a. Set **Reconnect Policy** to None.
b. Set Client ID Policy to Unrestricted.

c. Set Subscription Sharing Policy to shareable.

4. In the Transactions tab, set Transaction Timeout to 2147483647.

Configuring Credentials for Multiple JMS WebLogic Servers

The ECE installer gathers connection information for only one JMS WebLogic server on which the ECE notification queue (JMS topic) is to reside. If your ECE system includes multiple ECE notification queue hosts for failover, you must specify connection information for all the hosts.

To configure credentials for multiple JMS WebLogic servers:

1. Open the ECE_home/occeserver/config/JMSConfiguration.xml file.
2. Locate the <MessagesConfigurations> section.
3. Specify values for the parameters in the following JMSDestination name sections:
   - NotificationQueue: Read by the ECE charging nodes.
   - BRMGatewayNotificationQueue: Read by BRM Gateway.
   - DiameterGatewayNotificationQueue: Read by Diameter Gateway.

   **Note:** Do not change the value of the JMSDestination name parameter.

Each JMSDestination name section contains the following parameters:

- **HostName**: If you provided a value for the Host Name field on the ECE Notification Queue Details installer screen, that value appears here. Add this host to the ConnectionURL parameter, which takes precedence over HostName.

- **Port**: If you provided a value for the Port Number field on the ECE Notification Queue Details installer screen, that value appears here. Add this port number to the ConnectionURL parameter, which takes precedence over Port.

- **Protocol**: Specify the wire protocol used by your WebLogic servers in the ConnectionURL parameter, which takes precedence over Protocol.

- **ConnectionURL**: List all the URLs that applications can use to connect to the JMS WebLogic servers on which your ECE notification queue (JMS topic) or queues reside.

   **Note:** When this parameter contains values, it takes precedence over the deprecated HostName, Port, and Protocol parameters.

Use the following URL syntax:

`[t3|t3s|http|https|iiop|iiops]://address[,address]...`

where:

- `t3`, `t3s`, `http`, `https`, `iiop`, or `iiops` is the wire protocol used.

For a WebLogic server, use `t3`.
– address is hostlist:portlist.
– hostlist is hostname,hostname.
– hostname is the name of a WebLogic server on which a JMS topic resides.
– portlist is portrange, portrange.
– portrange is port, port range.
– port is the port number on which the WebLogic server resides.

Examples:

\[\begin{align*}
\text{t3://hostA:7001} \\
\text{t3://hostA,hostB:7001-7002}
\end{align*}\]

The preceding URL is equivalent to all the following URLs:

\[\begin{align*}
\text{t3://hostA,hostB:7001+7002} \\
\text{t3://hostA:7001-7002,hostB:7001-7002} \\
\text{t3://hostA:7001+7002,hostB:7001+7002} \\
\text{t3://hostA:7001,hostA:7002,hostB:7001,hostB:7002}
\end{align*}\]

**Note:** If multiple URLs are specified for a high-availability configuration, an application randomly selects one URL and then tries the others until one succeeds.

- **ConnectionRetryCount:** Specify the number of times a connection is retried after it fails.
  
  This applies only to clients that receive notifications from BRM.

- **ConnectionRetrySleepInterval:** Specify the number of milliseconds between connection retry attempts.

4. (Optional) Modify the values of the following parameters in the **JMSDestination name** section:

- **UserName:** Specify the user for logging on to the WebLogic server.
  
  This user must have write privileges for the JMS topic.

- **Password:** Specify the password for logging on to the WebLogic server.
  
  When you install ECE, the password you enter is encrypted and stored in the keystore. If you change the password, you must run a utility to encrypt the new password before entering it here. See the discussion about encrypting new passwords in *BRM System Administrator’s Guide*.

- **ConnectionFactory:** Specify the connection factory used to create connections to the JMS topic on the WebLogic server to which ECE publishes notification events.
  
  You must also configure settings in Oracle WebLogic Server for the connection factory. See the discussion about setting up a JMS topic on a WebLogic server, see the Oracle WebLogic Server documentation.

- **QueueName:** Specify the JMS topic that holds the published external notification messages.
■ **InitialContextFactory**: Specify the name of the initial connection factory used to create connections to the JMS topic queue on each WebLogic server to which ECE will publish notification events.

■ **RequestTimeOut**: Specify the number of milliseconds in which requests to the WebLogic server must be completed before the operation times out.

■ **KeyStorePassword**: If SSL is used to secure the ECE JMS queue connection, specify the password used to access the SSL keystore file.

■ **KeyStoreLocation**: If SSL is used to secure the ECE JMS queue connection, specify the full path to the SSL keystore file.

5. Save and close the file.

**Generating Java Keystore Certificates**

To generate Java keystore certificates for connecting to the Weblogic server, PDC, and BRM:

1. Log on to the driver machine.

2. Go to the `Java_home/bin` directory, where `Java_home` is the directory in which you installed the latest supported Java version.

3. Run the following commands:

   ```
   keytool -genkey -alias weblogic -dname CN=commonName OU=organizationalunit O=organization C=countryname -keyalg RSA -keypass mykeypass -keystore mykeystore -storepass mystorepass -validity valdays
   keytool -genkey -alias pdc -dname CN=commonName OU=organizationalunit O=organization C=countryname -keyalg RSA -keypass mykeypass -keystore mykeystore -storepass mystorepass -validity valdays
   keytool -genkey -alias brm -dname CN=commonName OU=organizationalunit O=organization C=countryname -keyalg RSA -keypass mykeypass -keystore mykeystore -storepass mystorepass -validity valdays
   ```

   where:

   ■ `commonName` is the first and last name.
   
   ■ `organizationalunit` is the container within a domain which can hold users, groups, and computers.
   
   ■ `organization` is the name of the organization.
   
   ■ `countryname` is the name of the country.
   
   ■ `mykeypass` is the key password for the certificate.
   
   ■ `mykeystore` is the keystore.
   
   ■ `mystorepass` is the keystore password.
   
   ■ `valdays` is the number of days that the keystore is valid.

   The Java keystore certificates for the Weblogic server, PDC, and BRM are generated.

**Exporting Java Keystore Certificates**

To export the Java keystore certificates to a file:

1. Log on to the driver machine.
2. Go to the `Java_home/bin` directory, where `Java_home` is the directory in which you installed the latest supported Java version.

3. Run the following commands:

   ```
   keytool -export -alias weblogic -keystore mykeystore -storepass mystorepass -rfc -file certificationname
   keytool -export -alias pdc -keystore mykeystore -storepass mystorepass -rfc -file certificationname
   keytool -export -alias brm -keystore mykeystore -storepass mystorepass -rfc -file certificationname
   
   where:
   - `certificationname` is the name of the file to store the Java keystore certificates for connecting to the Weblogic server, PDC, and BRM.
   - `mykeystore` is the keystore.
   - `mystorepass` is the keystore password.
   
   The Java keystore certificates for the Weblogic server, PDC, and BRM are exported to the certificate file; for example, public-admin.cer.
   ```

Importing Java Keystore Certificates

To import the Java keystore certificates into the default Java keystore:

1. Log on to the driver machine.

2. Go to the `Java_home/bin` directory, where `Java_home` is the directory in which you installed the latest supported Java version.

3. Run the following commands:

   ```
   keytool -import -alias weblogic -keystore `Java_home/jre/lib/security/cacerts` -storepass mystorepass -file certificationname -noprompt rm mykeystore certificationname
   keytool -import -alias pdc -keystore `Java_home/jre/lib/security/cacerts` -storepass mystorepass -file certificationname -noprompt rm mykeystore certificationname
   keytool -import -alias brm -keystore `Java_home/jre/lib/security/cacerts` -storepass mystorepass -file certificationname -noprompt rm mykeystore certificationname
   
   where:
   - `certificationname` is the name of the certificate file in which the Java keystore certificates for connecting to the Weblogic server, PDC, and BRM are stored.
   - `mykeystore` is the keystore.
   - `mystorepass` is the keystore password.
   
   The Java keystore certificates are imported into the default Java keystore.

Post-Installation Tasks for ECE Software Upgrade

This section describes the post-installation tasks you must perform for upgrading an existing installation.
**Important:** Rolling upgrade is not supported for upgrading to ECE 12.0. You must stop all ECE nodes of your existing installation, restore your ECE system, and then start all ECE nodes of your existing installation.

## Reconfiguring Configuration File Settings to Match Your Old Release

After installing ECE 12.0, reconfigure the default system and business configuration files of the new installation to match the settings in your old release configuration files.

Reconfigure all settings in the files of the following directories to match your old installation settings:

- `ECE_home/occeceserver/`
- `ECE_home/occeceserver/config`
- `ECE_home/occeceserver/brm_config`

You must move the configuration data, such as your custom customer profile data and request specification files, into the `ECE_New_home` created for ECE 12.0.

You can also use a merge tool to merge the configuration files you have changed in your old installation with the configuration files in the new installation.

**Important:** Do not use a merge tool for reconfiguring the settings in the `ECE_home/occeceserver/config/management/charging-settings.xml` file. New and changed properties can be introduced in this file, which would make the file difficult to merge.

To reconfigure settings of the `ECE_home/config/management/charging-settings.xml` file on your new installation:

1. On the driver machine, open the `(ECE_New_home/occeceserver/config/eceTopology.conf)` file.

2. For each physical server machine or unique IP address in the cluster, enable charging server nodes (such as the `ecs1` node) for JMX management by specifying a port for each node and setting it to `start CohMgt = true`.

**Important:** Do not specify the same port for the JMX management service that is used by your old ECE installation. Enable charging server nodes on your new installation for JMX management by using unique port numbers.

3. Save and close the file.

4. Start the JMX-management-enabled charging server nodes by doing the following:
   a. Change directory to the `ECE_New_home/occeceserver/bin` directory.
   b. Start Elastic Charging Controller (ECC):
      ```
      ./ecc
      ```
   c. Run the following command:
      ```
      start server
      ```
5. Access the ECE MBeans:
   a. Log on to the driver machine.
   b. Start a JMX editor, such as JConsole, that enables you to edit MBean attributes.
   c. Connect to the ECE charging server node set to start CohMgt = true in the ECE_home/oceceserver/config/eeeeTopo.conf file, where ECE_home is the directory in which you installed the old release.
      
      The eeeTopo.conf file also contains the host name and port number for the node.
   d. In the editor’s MBean hierarchy, expand the ECE Configuration node.

6. Use the JMX editor to enter values for all settings associated with your old release’s ECE_home/config/management/charging-settings.xml file and enter values for new settings introduced in the new release.

7. Stop the JMX-management-enabled charging server nodes.

Copying the Mediation Specification Data to the New Installation

The mediation specification data is not automatically copied to the new installation. You must manually copy the mediation specification data (for example, diameter_mediation.spec) in your old release’s ECE_home/oceceserver/config/management directory to the new installation.

For information about the mediation specification data, see BRM ECE Implementing Charging.

Upgrading Extension Code

If you customized rating by implementing ECE extensions using the ECE extensions API, apply the customizations to the corresponding files of the new installation.

Upgrade your extension code and recompile it. Recompile ECE_home/oceceserver/config/extensions with the new library. Ensure that the packaged extensions JAR files are available to the ECE runtime environment in the ECE_home/lib folder.

Updating the BRM Configuration Files

Update the BRM configuration files on your BRM installation.

Copy the ECE_home/oceceserver/brm_config/payloadconfig_ece_sync.xml file to your BRM environment and merge it with the version you are currently running on the BRM installation. Add your customizations to this file.

Deploying ECE 12.0 Onto Server Machines

If you installed an ECE standalone installation, you can skip this task.

Deploying ECE 12.0 onto the server machines means that you distribute the Elastic Charging Server node instances (charging server nodes) and other nodes defined in your topology file across the server machines.

To deploy ECE 12.0 onto your server machines:
1. Open the `ECE_New_home/oceceserver/config/eceTopology.conf` file and your old release topology file.

2. Verify the following:
   a. The settings in the `ECE_New_home/oceceserver/config/eceTopology.conf` file are the same as specified in your old release topology file.
      Your topology configuration must be identical to that of your old installation. Oracle recommends that you copy the topology file from your old installation.
   b. All the hosts included in the `ECE_New_home/oceceserver/config/eceTopology.conf` file have the same login ID (user ID) and the password-less SSH has been configured to all hosts from the driver machine.

3. Save and close the files.

4. Verify that all of the custom files and system and business configuration files of the new installation match the settings of your old installation configuration files and that your custom request specification files and custom customer profile data is being carried over.

5. Open the `ECE_New_home/oceceserver/config/management/migration-configuration.xml` file.

6. Verify that the `configObjectsDataDirectory` parameter is set to the directory where you store your configuration data (mediation specification used by Diameter Gateway).

7. Save and close the file.

8. Log on to the driver machine.

9. Change directory to `ECE_New_home/oceceserver/bin`.

10. Start ECC:
    ```
        ./ecc
    ```

11. Run the following command, which deploys the ECE installation onto server machines:
    ```
        sync
    ```
    
    The `sync` command copies the relevant files of the ECE installation onto the server machines in the ECE cluster.

**Stopping and Restoring Your ECE System**

Perform this task only if you want to restore the upgraded ECE system.

---

**Caution:** Restarting the ECE system removes all data from Coherence caches (stopping all charging server nodes removes all data from Coherence caches).

---

To restore an upgraded ECE system:

1. Stop all ECE nodes of the old ECE installation.

2. In PDC, publish all the PDC pricing data (the metadata, setup, pricing, and profile data) from the PDC database to ECE by running the following command:
ImportExportPricing -publish -metadata -config -pricing -profile -target [ece]

Running this command publishes all the metadata, setup, pricing, and profile data in the PDC database to ECE.

3. Ensure that you have reconfigured the ECE_New_home/config/management/charging-settings.xml file to match the settings (including customizations) in your old release and enter values for settings introduced in the new release.

4. On the driver machine, go to the ECE_New_home/oceceserver/bin directory.

5. Start ECC:
   
   ./ecc

6. Enable real-time synchronization of BRM and ECE customer data updates. See the discussion about configuring ECE for synchronizing BRM and ECE customer data in real time in BRM ECE Implementing Charging for more information.

7. Start ECE processes and gateways in the following order:

   ```
   Important: Depending on your installation, you start Diameter Gateway, RADIUS Gateway, or both.
   ```

   start server
   start configLoader
   start pricingUpdater
   start customerUpdater
   start emGateway
   start brmGateway
   start ratedEventFormatter
   start diameterGateway
   start radiusGateway

   All data is now back in the ECE data grid.

   Real-time-data updates, which had been temporarily disrupted due to the shutdown, are processed upon restart.

**Next Steps**

For a standalone installation, verify the installation. See "Verifying the ECE Installation" for instructions.

For an integrated installation, you are ready to implement ECE with the required software products in the charging system.
Verifying the ECE Installation

This chapter describes how to verify that Oracle Communications Billing and Revenue Management Elastic Charging Engine (ECE) was installed correctly. If you cannot verify the installation, see “Troubleshooting the ECE Installation”.

About Verifying the ECE Installation

In general, you verify the ECE installation by starting the ECE nodes in the cluster, loading the data needed for rating, and generating usage to verify that usage requests can be processed and customer balances can be impacted.

The specific tasks involved in verifying the ECE installation depend on whether you installed an ECE standalone installation or an ECE integrated installation.

About Verifying an ECE Standalone Installation

Verifying an ECE standalone installation involves using sample data to verify that ECE can process requests when working with other applications such as Pricing Design Center (PDC) and Oracle Communications Billing and Revenue Management (BRM) without having to connect to those applications. The ECE installer installs the sample data that you need for verifying the installation. Sample data includes request specification data, sample customer accounts, sample configuration data (such as credit card profile information), and sample pricing data.

About Verifying an ECE Integrated Installation

Verifying an ECE integrated installation involves performing tasks that require all products in the integrated system so you can verify that all product integration points are configured correctly.

The following are some general tasks involved in verifying an ECE integrated installation.

- Defining your pricing in PDC and successfully loading the pricing data into ECE
- Extracting data from BRM and successfully loading it into ECE
- Creating a new customer in BRM and having the customer successfully updated in ECE
- Rating usage requests in ECE and successfully creating CDR files of the rated events by the BrmCdrPluginDirect Plug-in
- Loading CDR files into BRM and successfully updating the customer balances in BRM from the loading of those files into the BRM database
Verifying an ECE Standalone Installation

Generating usage to verify that usage requests can be processed and customer balances can be impacted

Create usage requests and successfully submitting them to ECE for processing

Rating usage requests in ECE and successfully created CDR files containing the rated events

Loading the CDR files into BRM and successfully updating the customer balances in BRM

For verifying an integrated installation in the most minimal way, you need only set up one product offering in PDC and create one customer account in BRM.

Verifying an ECE Standalone Installation

This section describes how to verify an ECE standalone installation.

Starting ECE Nodes in the Cluster

To start all ECE charging server nodes in the cluster:

1. Log on to the driver machine.
2. Change directory to the $ECE_home/oceceserver/bin directory.
3. Start the Elastic Charging Controller (ECC):
   
   ```
   ./ecc
   ```
4. Start the ECE nodes by running the following command:
   
   ```
   start
   ```

To verify that the ECE nodes are running:

1. Access the ECE MBeans:
   a. Log on to the driver machine.
   b. Start the ECE charging servers (if they are not started).
   c. Start a JMX editor, such as JConosle, that enables you to edit MBean attributes.
   d. Connect to the ECE charging server node set to `start CohMgt = true` in the $ECE_home/oceceserver/config/eceTopology.conf file.

   The $eceTopology.conf file also contains the host name and port number for the node.
   e. In the editor's MBean hierarchy, expand the ECE State Machine node.

2. Expand StateManager.
3. Expand Attributes.
4. Verify that the `stateName` attribute is set to `Initial`.
   
   This means the ECE nodes are running.

Loading Sample Data

You load sample data so that you can rate simulated usage by using the ECE simulator.
This procedure assumes you are in the `ECE_home/oceceserver/bin` directory and have started the ECE nodes. See "Starting ECE Nodes in the Cluster" for instructions on starting the ECE nodes.

To load sample data, run the following commands:

```bash
start configLoader
start pricingLoader
start customerLoader
```

The `loader` utility generates and loads the sample data and puts the nodes in a usage processing state. The `customerLoader` utility loads both the cross-reference data and the customer data.

To verify that the ECE nodes are in a usage processing state:

1. Access the ECE MBeans:
   a. Log on to the driver machine.
   b. Start the ECE charging servers (if they are not started).
   c. Start a JMX editor, such as JConsole, that enables you to edit MBean attributes.
   d. Connect to the ECE charging server node set to `start CohMgt = true` in the `ECE_home/oceceserver/config/eeetopology.conf` file.
      The `eeetopology.conf` file also contains the host name and port number for the node.
   e. In the editor's MBean hierarchy, expand the ECE State Machine node.

2. Expand `StateManager`.

3. Expand `Attributes`.

4. Verify that the `stateName` attribute is set to `UsageProcessing`.

   This means the ECE nodes are running in a usage processing state.

---

**Verifying that Usage Requests Can Be Processed for a Standalone Installation**

You use the ECE simulator to run a sample workload and verify that usage requests can be processed. The simulator emulates network traffic coming from network mediation software and uses the sample data that you loaded to process the usage requests. You use the Coherence query tool to verify that the usage has impacted the sample customer’s balance.

The simulator allows you to control the types of usage requests sent and the number and type of subscribers sending the usage requests. See the discussion about using the simulator in *BRM ECE Implementing Charging* for more information.

This procedure assumes you are in the `ECE_home/oceceserver/bin` directory and have started the ECE nodes and loaded sample data. See "Starting ECE Nodes in the Cluster" and "Loading Sample Data" for instructions.

To verify that usage requests can be processed:

1. Start the ECE simulator:

   ```bash
   start simulator
   ```

2. Initialize the simulator:

   ```bash
   init simulator
   ```
3. Run the sample workload:
   
   ```
   simulate simulator
   ```

   The simulator will take a few seconds to complete processing the workload. This command sends requests to the ECE charging server.

4. Open the `invocation.log` file located in `ECE_home/occeserver`. You should see statistics for the sample workload.

5. From the `ECE_home/occeserver/bin` directory, enter the following commands to run the Coherence query tool:
   
   ```
   ./query.sh
   select * from Customer
   ```

   This command returns all customer information.

6. In the results of the query that are returned, locate the following string:
   
   ```
   {currentBalance=UnitValue{quantity=amount, unit=Money{cur=USD}}
   ```

   where `amount` shows the quantity amount of the balance impact.

---

**Verifying an ECE Integrated Installation**

To verify that you can start charging server nodes in an integrated installation, see "Starting Charging Server Nodes in a Distributed Environment".

**Starting Charging Server Nodes in a Distributed Environment**

To start all ECE charging server nodes across the cluster in a distributed environment (over multiple physical server machines):

1. Log on to the driver machine.

2. Change directory to the `bin` directory:
   
   ```
   cd ECE_home/occeserver/bin
   ```

3. Start ECC:
   
   ```
   ./ecc
   ```

4. Start ECE charging server nodes on all server machines in your distributed environment by running the following command:
   
   ```
   start
   ```

   To verify that the ECE charging server nodes are running:

1. Access the ECE MBeans:
   
   a. Log on to the driver machine.

   b. Start the ECE charging servers (if they are not started).

   c. Start a JMX editor, such as JConsole, that enables you to edit MBean attributes.

   d. Connect to the ECE charging server node set to `start CohMgt = true` in the `ECE_home/occeserver/config/eceTopology.conf` file.

   The `eceTopology.conf` file also contains the host name and port number for the node.
e. In the editor’s MBean hierarchy, expand the **ECE State Machine** node.

2. Expand **StateManager**.

3. Expand **Attributes**.

4. Verify that the **stateName** attribute is set to **Initial**.

   This means the ECE charging server nodes are running.

### Troubleshooting the ECE Installation

The ECE installer writes information to log files. You can check these log files for information about errors and actions performed during the installation.

### Installation Log Files

The ECE installation logs can be found at `CentralInventorylocation/oraInventory/logs`, where `CentralInventorylocation` is the directory path to the `oraInventory` directory. You can specify any inventory path.

You use the following log files to monitor installation and post-installations:

- `installActionTimeStamp.log`
- `oraInstallTimeStamp.err`
- `oraInstallTimeStamp.out`
- `silentInstallTimeStamp.log` (for silent mode installation)

### Next Steps

After installing and verifying the ECE installation, you perform additional tasks to set up your test or production system:

- Complete the integration between ECE, BRM, and PDC:
  - Define your event definitions in PDC.
  - Set up all your product offerings in PDC and publish them to the JMS pricing component queue.
  - Synchronize your PDC product offerings with BRM.
- Set up ECE system security.
- Configure the ECE system.
- Configure ECE to purge rated events that are no longer needed from the Oracle NoSQL Database so that rated events can be maintained at a manageable level.
- If you installed the optional product Oracle Application Management Pack for Oracle Communications, see *Oracle Application Management Pack for Oracle Communications System Administrator’s Guide* for information about monitoring ECE nodes and clusters.
This chapter describes the tasks you perform to uninstall the Oracle Communications Billing and Revenue Management Elastic Charging Engine (ECE) 12.0 software from your computer.

For details on how to uninstall Oracle database, see the database vendor’s documentation for your platform.

Uninstalling the ECE Software

You can use Oracle Universal Installer to uninstall the ECE software.

---

**Important:** Uninstalling ECE does not uninstall the configuration files generated during the ECE installation. You must remove these files manually.

---

To uninstall ECE:

1. Go to the `ECE_home/oui/bin` directory, where `ECE_home` is the directory in which you installed ECE.

2. Run the following command:

   ```bash
   ./deinstall.sh
   ```

   The Distribution to Uninstall screen appears.

3. Select the ECE software.

4. Click Uninstall.

   The Welcome screen appears.

5. Click Next.

   The Uninstallation Summary screen appears.

6. Click Uninstall.

   The Uninstallation Progress screen appears.

7. Click Next.

   The Uninstallation Complete screen appears.

8. Click Finish.
Uninstalling ECE in the Silent Mode

To uninstall ECE in the silent mode:

1. Go to the ECE_home/oui/bin directory.
2. Run the following command:

   ./deinstall.sh -responseFile path -silent -uninstall

   where path is the absolute path to the response file that you created in the root directory during the GUI installation of ECE.