Oracle® Fusion Middleware

Installing Oracle Unified Directory

11*g* Release 2 (11.1.2.3)

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Documentation for installers and system administrators that describes how to install and uninstall Oracle Unified Directory and how to setup Oracle Unified Directory as a directory server instance, proxy server instance, or replication gateway.

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Oracle Fusion Middleware Installing Oracle Unified Directory 11*g* Release 2 (11.1.2.3)

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Contents

3 Setting Up Oracle Unified Directory as a Directory Server

4 Setting Up Oracle Unified Directory as a Proxy Server

5 Setting Up Oracle Unified Directory as a Replication Gateway

6 Updating the Oracle Unified Directory Software

7   Configuring the JVM, Java, and Database Cache Options for Oracle Unified Directory

8   Managing Oracle Unified Directory as a Windows Service

9   Deinstalling Oracle Unified Directory

List of Tables

Preface

This guide describes how to install and deinstall the Oracle Unified Directory software and how to setup Oracle Unified Directory as a directory server instance, proxy server instance, or replication gateway. This guide also describes the installation requirements and the minimum configuration required to get started using a server.

This Preface includes the following sections:

- Audience
- Documentation Accessibility
- Related Documents
- Conventions

Audience

This guide is intended for installers and system administrators and other users who want to install Oracle Unified Directory as a directory server, proxy server, or replication gateway.

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.

Related Documents

You might want to refer to the following Oracle Unified Directory documentation:

- *Oracle Fusion Middleware Administering Oracle Unified Directory*
- *Oracle Fusion Middleware Developing Plug-Ins for Oracle Unified Directory*
- *Oracle Fusion Middleware Configuration Reference for Oracle Unified Directory*
- *Oracle Fusion Middleware Release Notes for Oracle Unified Directory*

Conventions

The following text conventions are used in this guide:

Convention	Meaning
boldface	Boldface type indicates graphical user interface elements associated with an action, or terms defined in text or the glossary.
italic	Italic type indicates book titles, emphasis, or placeholder variables for which you supply particular values.
`monospace`	Monospace type indicates commands within a paragraph, URLs, code in examples, text that appears on the screen, or text that you enter.

What's New in This Guide

This chapter describes the changes in this guide for Oracle Unified Directory 11g Release 2 (11.1.2.3).

These changes include:

- New Title For This Guide
- JDK 7 or JRE 7 Required for `oud-setup` Scripts
- Oracle Components Integration Changes to the Server Setup Scripts
- Tuning Changes to the Server Setup Scripts

New Title For This Guide

This guide is the new edition of the formerly titled *Oracle Fusion Middleware Installation Guide for Oracle Unified Directory*.

JDK 7 or JRE 7 Required for `oud-setup` Scripts

To run the Oracle Unified Directory setup scripts described in this guide, JDK 7 or JRE 7 is required.

See Section 1.3, "Setting the `JAVA_HOME` Environment Variable."

Oracle Components Integration Changes to the Server Setup Scripts

In both graphical user interface (GUI) and command-line (CLI) modes, the server setup scripts (`oud-setup` or `oud-setup.bat`) simplify the integration of these Oracle components: Directory Integration Platform (DIP), E-Business Suite (EBS), Enterprise User Security (EBS), and Oracle Database Net Services.

See Chapter 3, "Setting Up Oracle Unified Directory as a Directory Server."

Tuning Changes to the Server Setup Scripts

Tuning changes to the server setup scripts (`oud-setup` or `oud-setup.bat`) in GUI mode include:

- The default tuning option provides more aggressive tuning than in previous releases.
- On the Server Tuning screen, the number of options is reduced to these choices:
  - Providing Runtime Options is a combination of the previous options based on the server memory and directory data.

- Providing the Memory to be Used by OUD (the default) is the same as in previous releases.

Tuning changes to the server setup scripts (`oud-setup` or `oud-setup.bat`) in CLI mode include:

- The `--serverTuning` option now allows you to specify the percentage of the system memory to be used for Oracle Unified Directory server.

- The `--importTuning` option is renamed to `--offlineToolsTuning` (`--importTuning` usage is still available for backward compatibility).

See Chapter 3, "Setting Up Oracle Unified Directory as a Directory Server."

1

Planning the Oracle Unified Directory Installation

This chapter describes the planning you should do, including information you should consider, before installing Oracle Unified Directory.

This chapter includes the following sections:

- Section 1.1, "Checking the System Requirements for Oracle Unified Directory"
- Section 1.2, "Selecting an Oracle Unified Directory Server Role"
- Section 1.3, "Setting the JAVA_HOME Environment Variable"
- Section 1.4, "Understanding the Oracle Unified Directory Installation Directories"

1.1 Checking the System Requirements for Oracle Unified Directory

Before you install Oracle Unified Directory or any related products, check the certification matrix and system requirements to ensure that your environment meets the minimum requirements for the products you are installing. The following documents are available on the Oracle Technology Network (OTN):

- The certification matrix contains information about supported installation types, platforms, operating systems, databases, JDKs, and third-party products.

  To view this document:

  1. Access the Oracle Fusion Middleware Supported System Configurations page:

     http://www.oracle.com/technetwork/middleware/ias/downloads/fusion-c
     ertification-100350.html

  2. Scroll down to System Requirements and Supported Platforms for Oracle Identity and Access Management 11g Release 2 (11.1.2.3.0).

  3. Click the xls link to view the certification matrix.

- The *Oracle Fusion Middleware Patching Guide for Oracle Identity and Access Management* describes the process of patching an Oracle Fusion Middleware Identity and Access Management 11*g* Release 2 (11.1.2.3) deployment.

1.1.1 Pre-Installation System Notes

Pre-installation considerations for Oracle Unified Directory include the following:

- On Windows systems you must have administrator privileges to install the Oracle Unified Directory software.

- Before running the installer, set the `DISPLAY` environment variable on your system.

- On UNIX and Linux systems, installation as the root user is not supported.

- The Oracle Unified Directory software treats global, full local, and sparse zones as an independent physical system. Installing Oracle Unified Directory in any type of Solaris zone is therefore like installing on an independent system. Oracle Unified Directory does not share services or file locations with other zones.

1.1.2 Running the Oracle Identity and Access Management Health Checker

The Health Checker is a tool you can run to test various configurations in an Oracle Identity and Access Management environment. You can run the Health Checker at the post-configuration stage of an Oracle Unified Directory deployment.

The Health Checker retrieves data from your environment and compares this data with the Oracle recommended values for the various configuration settings. The Health Checker then generates a report that provides detailed information about each of the items that it checked.

For more information, including how to run the Health Checker, see the *Oracle Fusion Middleware Verifying Your Oracle Identity and Access Management Environment*.

This guide also provides manual checklists for deploying Oracle identity and Access Management components in production, including a checklist for Oracle Unified Directory.

1.2 Selecting an Oracle Unified Directory Server Role

Oracle Unified Directory can function in the following three modes or roles:

- Section 1.2.1, "About Oracle Unified Directory as a Directory Server"

- Section 1.2.2, "About Oracle Unified Directory as a Proxy Server"

- Section 1.2.3, "About Oracle Unified Directory as a Replication Gateway"

The following sections describe which Oracle Unified Directory mode you should use, based on your requirements.

As a general rule, the use of the generic term *server* can apply to the directory server, proxy server, or replication gateway.

1.2.1 About Oracle Unified Directory as a Directory Server

To create an LDAP directory server that contains directory data, set up Oracle Unified Directory as a directory server. For more information, see Chapter 3, "Setting Up Oracle Unified Directory as a Directory Server."

1.2.2 About Oracle Unified Directory as a Proxy Server

When you set up Oracle Unified Directory as an LDAP proxy server, the server acts as an interface between the client and a remote LDAP server containing the data. The proxy server manages the client requests through load balancing, data distribution, or both. The proxy does not contain any data. The proxy can also manipulate the data sent by the client or received from the remote LDAP servers (for example, DN renaming, RDN changing, transformation, or Enterprise User Security).

When you use the Oracle Unified Directory proxy, your data is stored in one or more remote LDAP servers or data centers, which can be any LDAPv3-compliant directory

server such as Oracle Unified Directory directory server or Oracle Directory Server Enterprise Edition.

For more information, see Chapter 4, "Setting Up Oracle Unified Directory as a Proxy Server."

1.2.3 About Oracle Unified Directory as a Replication Gateway

When you set up Oracle Unified Directory as a replication gateway, the server acts as a gateway that enables replication between Oracle Directory Server Enterprise Edition and Oracle Unified Directory.

For more information, see Chapter 5, "Setting Up Oracle Unified Directory as a Replication Gateway."

1.3 Setting the `JAVA_HOME` Environment Variable

You must provide Oracle Unified Directory with information about the location of the Java installation by setting the JAVA_HOME environment variable. The setup scripts will not work if the JAVA_HOME environment variable is not set or does not point to a supported Java installation (JRE 7 or JDK 7).

For example, on UNIX or Linux systems, run a command similar to the following, depending on your shell:

```
$ export JAVA_HOME=/usr/lang/JAVA/jre1.7
```

Or, on Windows systems:

1. Right click the Computer icon on your Desktop and select **Properties**.

2. In the System window select **Advanced system settings** in the left pane.

3. In the System Properties window select the Advanced tab and click **Environment Variables**.

4. In the Environment Variables window, click **New** under the User variables pane.

5. In the New User Variable window, enter the following information:

   - **Variable name:** Enter JAVA_HOME

   - **Variable value:** Enter the path to a supported Java installation (JRE 7 or JDK 7). For example:

     ```
     C:\Program Files\Java\jdk1.7.0
     ```

6. Click **OK**.

> **Note:** You can also set the JAVA_HOME by running a command similar to the following:
>
> ```
> set JAVA_HOME=C:\Program Files\Java\jdk1.7.0
> ```

1.4 Understanding the Oracle Unified Directory Installation Directories

During the software installation, you are asked to specify several installation directories. It is helpful to have an understanding of those directories and what they contain when installation is complete. The following directories are created:

- Oracle Middleware Home Location

- Oracle Home Directory
- Oracle Common Directory
- Oracle WebLogic Domain Directory

1.4.1 Oracle Middleware Home Location

Oracle Middleware home is the directory under which Oracle Unified Directory, Oracle WebLogic Server, and Oracle Application Development Framework are installed. Oracle WebLogic Server and the Application Development Framework must be installed if you plan to manage Oracle Unified Directory using Oracle Directory Services Manager (ODSM).

> **Note:**   If you are planning to install Oracle Unified Directory, Oracle WebLogic Server, and Oracle ADF, you must install all three components using the same Middleware home directory.

1.4.2 Oracle Home Directory

An Oracle home contains installed files necessary to host a specific product. The Installer installs the files required to host the component, such as binaries and libraries, in the Oracle Home directory. It contains the Oracle Unified Directory setup files to set up individual instances. Also contains the default schema files for all server instances associated with that OUD_ORACLE_HOME.

An Oracle home resides within the directory structure of the Middleware home. Each Oracle home can be associated with multiple Oracle instances or Oracle WebLogic Server domains.

The default OUD_ORACLE_HOME directory is Oracle_OUD1.

1.4.3 Oracle Common Directory

The installer creates this directory under the location you enter in the Oracle Middleware Home Location field. This directory contains the Application Development Framework.

The default directory is oracle_common.

1.4.4 Oracle WebLogic Domain Directory

A WebLogic domain includes a special WebLogic Server instance called the Administration Server, which is the central point from which you configure and manage all resources in the domain.

Usually, you configure a domain to include additional WebLogic Server instances called Managed Servers. You deploy Java components, such as Web applications, EJBs, and Web services, and other resources to the Managed Servers and use the Administration Server for configuration and management purposes only.

The directory structure of a domain is separate from the directory structure of the WebLogic Server home. It can reside anywhere; it need not be within the Middleware home directory. A domain is a peer of an Oracle instance.

By default, the Oracle Fusion Middleware Configuration Wizard creates a domain as subdirectory in a directory named user_projects under your Middleware Home directory (MW_HOME).

1.4.5 Oracle Unified Directory Installation Directory Structure

The following example shows the directory structure of an Oracle Unified Directory installation on a single host using all of the default values.

In this example, *install-directory* can be any directory on your system. This directory is empty before you install Oracle Unified Directory.

Example 1–1   Oracle Unified Directory Installation Directory Structure

```
install-directory/
                coherence_3.7
                domain-registry.xml
                logs
                modules
                ocm.rsp
                Oracle_OUD1
                oracle_common
                registry.dat
                registry.xml
                user_projects
                utils
                wlserver_10.3
```

> **Note:**   If you are planning to manage Oracle Unified Directory with Oracle Directory Services Manager (ODSM), you must also install Oracle WebLogic Server and Oracle ADF. You must specify the same Middleware home directory to install all three products.

2

Installing the Oracle Unified Directory Software

This chapter describes how to obtain and install Oracle Unified Directory, Oracle WebLogic Server, and the Oracle Application Development Framework (Oracle ADF).

This chapter includes the following sections:

- Section 2.1, "Obtaining the Software to Install Oracle Unified Directory"

- Section 2.2, "Installing Oracle Unified Directory"

- Section 2.3, "Configuring Oracle WebLogic Server for Oracle Directory Services Manager"

- Section 2.4, "Configuring Oracle Unified Directory with Oracle Directory Integration Platform"

You can manage Oracle Unified Directory either from the command line or by using the Oracle Directory Services Manager (ODSM) graphical user interface. ODSM requires Oracle WebLogic Server and Oracle ADF, so if you plan to use ODSM, you must also install these additional components.

If you do not plan to use ODSM, you need to download and install only Oracle Unified Directory.

ODSM is installed when you install Oracle Unified Directory, but ODSM must be configured when you have installed Oracle WebLogic Server and Oracle ADF.

> **Note:** The version of ODSM described in this document is 11g Release 2 (11.1.2.3). You can use ODSM version 11.1.2.3 to manage only Oracle Unified Directory 11g Release 2 (11.1.2.3.)
>
> You cannot use ODSM version 11.1.2.3 to manage previous versions of Oracle Unified Directory, Oracle Internet Directory, or Oracle Virtual Directory. Conversely, you cannot use versions of ODSM shipped with Oracle Internet Directory or Oracle Virtual Directory to manage any versions of Oracle Unified Directory.

The installation process requires that you identify certain directories into which the software is installed. For a complete understanding of the installation directory structure, see Section 1.4, "Understanding the Oracle Unified Directory Installation Directories."

2.1 Obtaining the Software to Install Oracle Unified Directory

This section describes how to obtain the following software:

- Oracle Unified Directory 11g Release 2 (11.1.2.3.0)
- Oracle WebLogic Server
- Oracle Application Development Framework 11g Release 1 (11.1.1.9.0)

Notes:

- If you are planning to manage Oracle Unified Directory using ODSM, you must also install Oracle WebLogic Server and Oracle ADF.

- When you install Oracle Unified Directory, Oracle WebLogic Server, and Oracle ADF you must specify the same Middleware home directory. The examples in this chapter use *path-to-mw-home*/MW_HOME to represent the Middleware home directory.

2.1.1 Oracle Unified Directory 11*g* Release 2 (11.1.2.3.0)

To download the Oracle Unified Directory software from the Oracle Software Delivery Cloud:

1. Download the production distribution for Oracle Unified Directory from the Oracle Software Delivery Cloud.

2. If prompted, login, choose your language, and click **Continue**.

3. Enter Oracle Unified Directory in the type-ahead input field and click **Search**.

4. Select **Oracle Unified Directory 11.1.2.3.0** from the list of available platforms.

   After you have made your selection, the software title will immediately be placed into your Selected Software cart where you can assign a platform for each individual Release.

5. Click your **Selected Software** cart.

6. Select your platform from the **Platform/Language** drop-down list for **Oracle Unified Directory 11.1.2.3.0** and click **Continue**.

7. Complete the Terms & Restrictions and Export License Agreement as instructed on the site and click **Continue**.

8. Click on the file name to download. Each file has a unique part number.

9. Browse to the directory where you want to save the file. Click **Save** to start the file download. A compressed ZIP file is downloaded.

10. Extract the contents of the ZIP file to a directory of your choice.

Note: ODSM is also installed when you install the Oracle Unified Directory software. However, you must configure ODSM, as described in Section 2.3, "Configuring Oracle WebLogic Server for Oracle Directory Services Manager."

2.1.2 Oracle WebLogic Server

If you are planning to configure and manage Oracle Unified Directory with ODSM, you must also install Oracle WebLogic Server (and Oracle ADF), as described in subsequent sections.

You can download the Oracle WebLogic Server 11g Release 1 (10.3.6) installation program from either of the following locations:

- https://edelivery.oracle.com/

- http://www.oracle.com/technetwork/middleware/weblogic/overview/index.html

For more information, see:

- Product distribution in the *Oracle Fusion Middleware Installation Guide for Oracle WebLogic Server*

- Section 1.1, "Checking the System Requirements for Oracle Unified Directory"

2.1.2.1 Downloading the Oracle WebLogic Server Installer from Oracle Software Delivery Cloud

To download the Oracle WebLogic Server installer from the Oracle Software Delivery Cloud:

1. Download the production distribution for Oracle Unified Directory from the Oracle Software Delivery Cloud.

2. If prompted, login, choose your language, and click **Continue**.

3. Enter Oracle WebLogic Server 10.3.6.0.0 in the type-ahead input field and click **Search**.

4. Select **Oracle WebLogic Server 10.3.6.0.0** from the list of available platforms.

   After you have made your selection, the software title will immediately be placed into your Selected Software cart where you can assign a platform for each individual Release.

5. Click your **Selected Software** cart.

6. Select your platform from the **Platform/Language** drop-down list for **Oracle WebLogic Server 10.3.6.0.0** and click **Continue**.

7. Complete the Terms & Restrictions and Export License Agreement as instructed on the site and click **Continue**.

8. Click on the file name to download. Each file has a unique part number.

9. Browse to the directory where you want to save the file. Click **Save** to start the file download. A compressed ZIP file is downloaded.

10. Extract the contents of the ZIP file to a directory of your choice.

2.1.2.2 Downloading the Oracle WebLogic Server Installer from Oracle Technology Network

To download the Oracle WebLogic Server installer from the Oracle Technology Network:

1. Download the production distribution for Oracle WebLogic Server from the Oracle Technology Network.

2. Accept the OTN License Agreement.

3. Click a package of your choice under **Oracle WebLogic Server 10.3.6**.

4. Click **OK** to save the file.

5. Browse to the directory where you want to save the file. Click **Save** to start the file download. A compressed ZIP file is downloaded.

6. Extract the contents of the ZIP file to a directory of your choice.

2.1.3 Oracle Application Development Framework 11*g* Release 1 (11.1.1.9.0)

If you are planning to configure and manage Oracle Unified Directory with ODSM, you must install Oracle ADF.

You can download Oracle ADF from the Oracle Technology Network (OTN) at the following location:

http://www.oracle.com/technetwork/developer-tools/adf/downloads/index.html

2.2 Installing Oracle Unified Directory

To install Oracle Unified Directory, complete the following steps:

1. Make sure you have obtained the software, as described in Section 2.1, "Obtaining the Software to Install Oracle Unified Directory."

2. Make sure you have a supported Java installation (JRE 7 or JDK 7) installed. See Section 1.3, "Setting the JAVA_HOME Environment Variable."

3. If you have not already done so, extract the contents of the .zip file, which contains only the appropriate Oracle Unified Directory installer executable for the selected platform. The installer is located in the .zip file part number directory.

> **Note:**   If you are also planning to install Oracle WebLogic Server and Oracle ADF, you must specify the same Middleware home directory to install all three products.

4. Use the cd command to move from your present working directory to the directory where you extracted the contents of the Oracle Unified Directory .zip file.

   For example, to move to the Middleware home directory on UNIX and Linux systems:

   ```
   $ cd path-to-mw-home/MW_HOME
   ```

   Or, on Windows systems:

   ```
   C:\>cd path-to-mw-home\MW_HOME
   ```

5. Start the Oracle Universal Installer (OUI) by running the runInstaller script (UNIX and Linux systems) or setup.exe script (Windows systems), specifying the location of a supported Java installation (JRE 7 or JDK 7).

> **Caution:**   Do not run the Oracle Unified Directory installer as the root user on UNIX and Linux systems.

   On UNIX and Linux systems:

   ```
   $ ./runInstaller -jreLoc path-to-JRE/JDK-directory
   ```

   For example, using the JAVA_HOME environment variable:

   ```
   $ ./runInstaller -jreLoc $JAVA_HOME
   ```

Or, on Windows systems:

```
C:\>setup.exe -jreLoc path-to-JRE/JDK-directory
```

For example:

```
C:\>setup.exe -jreLoc $JAVA_HOME
```

Note: On Windows systems, if the path to your Java installation includes a space character, you must specify the path in DOS 8.3 format. For example:

```
C:\>setup.exe -jreLoc C:\Progra~1\Java\jre1.7
```

Running the installer creates the `Oracle_OUD1` directory under the Middleware home directory.

6. On UNIX and Linux systems, if this is the first OUI-based product to be installed on the system, the **Specify Inventory Directory** screen is displayed. Perform the following steps:

a. Specify an **Inventory Directory**.

The central Inventory Directory contains information relating to all Oracle products that are installed on this host. It includes an `inventory.xml` file and a `logs` directory. The `inventory.xml` file lists the Oracle home directories that are installed on the system.

For each Oracle home, it also lists the home name, the home index, and the nodes on which the home is installed. You should not remove or manually edit this file as this might affect installation and patching.

b. Enter the ID of a group that has write access to the inventory directory.

c. Click **OK** to continue. The **Inventory Location Confirmation Dialog** is displayed.

d. In a separate terminal window, as a user with root privileges, run the script located at
`/inventory-directory/createCentralInventory.sh`
where `inventory-directory` is the path that you specified in Step a.

The `createCentralInventory.sh` script does the following:

– Sets the inventory directory and group name to what you specified in steps a and b.

– Creates an Oracle inventory pointer file (`/var/opt/oracle/oraInst.loc`).

– Changes the permissions of the inventory directory to 770.

e. When you have run the script, click **OK** on the Inventory Location Confirmation Dialog.

If you do not have root access to the system and want to continue with the installation, select **Continue With Local Inventory**.

If other Oracle products have been installed on this system, the inventory screen is not displayed.

On Windows systems, you are not prompted to specify an inventory directory. The inventory directory is created in a default location under `C:\Program Files\Oracle\Inventory`.

7. On the Welcome screen, click **Next**.

   The **Install Software Updates** screen is displayed.

8. Select **Skip Software Updates** and click **Next**.

   The **Prerequisite Checks** screen is displayed.

9. Monitor the prerequisites checking.

   If there is an issue, an error or warning message is displayed. Investigate the issue and resolve it. After resolving the issue, click **Retry** to restart the prerequisite checks.

   You can proceed with the installation without resolving the issue by clicking **Continue**. However, failing to resolve the issue during the prerequisites checking may cause additional issues later in the installation.

   If all prerequisite checks pass inspection, click **Next**.

   The **Specify Installation Location** screen is displayed.

10. Enter the following information:

    - **OUD Base Location Home**: Specify a directory that you want to use as the Middleware home, which will include any Oracle Unified Directory instances that are configured at a later stage, unless you specify an alternate instance directory path. For example, `/Oracle/MW_Home`.

    - **Oracle Home Directory.** The Installer uses the name you enter in this field to create the Oracle home directory under the Middleware home location you enter in the OUD Base Location field. The Installer installs the files (such as binaries and libraries) required to host Oracle Unified Directory in the Oracle home directory. The Oracle home directory is commonly referred to as `ORACLE_HOME`. The default Oracle home directory for Oracle Unified Directory is `Oracle_OUD1`.

    Click **Next**.

    The **Installation Summary** screen is displayed.

11. Verify the installation and configuration information.

    Click **Save** to save the installation response file, which contains your responses to the Installer prompts and fields. You can use this response file to perform silent installations.

    The installation response file is not saved by default-you must click **Save** to retain it.

    Click **Install**.

    The **Installation Progress** screen is displayed.

12. Click **Next**.

    The **Installation Complete** screen is displayed.

13. Check the details of the installation and click **Finish**.

    > **Tip:** After a successful installation, save the **OUD Installation details** in a text file for your future reference.

After you have installed Oracle Unified Directory, you can configure a server instance as a directory server, proxy server, or replication gateway. For more information, see one of the following sections:

- To set up a directory server, see Section 3, "Setting Up Oracle Unified Directory as a Directory Server."

- To set up a proxy server, see Section 4, "Setting Up Oracle Unified Directory as a Proxy Server."

- To set up a replication gateway, see Section 5, "Setting Up Oracle Unified Directory as a Replication Gateway."

2.2.1 Performing an Oracle Unified Directory Silent Installation

An Oracle Unified Directory silent installation uses a set of responses that you provided in an earlier installation and thus does not require any user intervention.

To perform an Oracle Unified Directory silent installation:

1. Follow steps 1 through 9 of Section 2.2, "Installing Oracle Unified Directory."

2. Click **Save** on the **Installation Summary** screen.

3. Specify the location to which the response file should be saved, for example `/tmp/oud-install.rsp` (UNIX and Linux systems), and click **Save**.

4. When the response file has been saved, cancel the installation.

5. Run the following command to perform the silent installation:

   On UNIX and Linux systems:

   ```
   $ download-path/oud/Disk1/runInstaller -jreLoc $JAVA_HOME -silent -responseFile
   /tmp/oud-install.rsp
   ```

   On Windows systems:

   ```
   C:\>download-path\oud\Disk1\setup.exe -jreLoc $JAVA_HOME -silent -responseFile
   \tmp\oud-install.rsp
   ```

2.3 Configuring Oracle WebLogic Server for Oracle Directory Services Manager

If you plan to manage Oracle Unified Directory with ODSM, you must install and configure Oracle WebLogic Server, by following these steps:

- Installing Oracle WebLogic Server

- Installing Oracle Application Development Framework for Oracle WebLogic Server

- Running Oracle Fusion Middleware Configuration Wizard to Create an Oracle WebLogic Domain

- Accessing Oracle Directory Services Manager (ODSM) for Oracle WebLogic Server

2.3.1 Installing Oracle WebLogic Server

Make sure you have obtained the required software, as described in Section 2.1, "Obtaining the Software to Install Oracle Unified Directory."

For information about preparing for installation and installing Oracle WebLogic Server, see the *Oracle Fusion Middleware Installation Guide for Oracle WebLogic Server*.

Notes:

- You must install Oracle WebLogic Server as the same user who installed Oracle Unified Directory.

- On UNIX and Linux systems, do not install Oracle WebLogic installer as the `root` user.

- When you install WebLogic Server, you must use the same Middleware home directory that you used to install Oracle Unified Directory.

  On the **Choose Middle Home Directory** screen, check **Create a new Middleware Home** and then specify the same Middleware home you used for Oracle Unified Directory. You can ignore the warning that this directory is not empty and click **Yes** to continue.

- Installing WebLogic Server creates the `wlserver_10.3` and `coherence_3.7` directories under the Middleware home directory.

2.3.2 Installing Oracle Application Development Framework for Oracle WebLogic Server

Oracle Directory Services Manager is a Java EE application that runs inside an Oracle WebLogic Server container and relies on certain libraries that are not installed with the Oracle Unified Directory software. These libraries are provided in Oracle ADF. If you plan to manage Oracle Unified Directory with ODSM, you must also install Oracle ADF.

For information about installing Oracle ADF, see the *Oracle Fusion Middleware Installation Guide for Application Developer*.

Notes:

- You must install Oracle ADF as the same user who installed Oracle Unified Directory and WebLogic Server, which on Linux and UNIX systems is not the `root` user.

- For the Oracle ADF **Inventory Directory**, specify the same directory you used for Oracle Unified Directory.

- For the Oracle ADF **Oracle Middleware Home**, use the same Middleware home directory you used for Oracle Unified Directory and WebLogic Server.

  If you do not use the same Middleware home directory, WebLogic Server will be grayed out in the subsequent Oracle ADF **Application Server** selection.

- After a successful installation, click **Save** for **Save Installation Details** to save the information in a text file for your future reference.

After you install Oracle ADF, you are ready to create an ODSM instance, as described in the next section.

2.3.3 Running Oracle Fusion Middleware Configuration Wizard to Create an Oracle WebLogic Domain

When you have installed Oracle ADF, you must create a new WebLogic domain for ODSM. The following procedure outlines the configuration on a UNIX or Linux system.

1. Run the configuration wizard from the following location:

   ```
   $ path-to-mw-home/MW_HOME/oracle_common/common/bin/config.sh
   ```

   On Windows systems, run the `config.cmd` script.

2. On the Welcome screen, select **Create a new WebLogic domain** and click **Next**.

   The **Select Domain Source** screen is displayed.

3. Select the **Oracle Directory Services Manager - 11.1.2.3.0** check box.

   Note: If Oracle WebLogic Server and Oracle Unified Directory do not share the same Middleware home directory, ODSM will not be available in the panel.

   When you select ODSM, Oracle JRF is automatically selected.

   Click **Next**.

   The **Specify Domain Name and Location** screen is displayed.

4. Type a domain name and specify its location.

   A new WebLogic domain is created in this location, and ODSM and its related components are deployed into this domain.

   Make a note of the domain location as you will need it to start the WebLogic domain in the following procedure.

   Click **Next**.

   The **Configure Administrator User Name and Password** screen is displayed.

5. Enter a name and password for the user who will administer this domain.

   The password must be at least eight characters and must contain at least one number or special character. Confirm the password and click **Next**.

   Make a note of these details as you will need them to start or restart the WebLogic domain in the following procedure.

   Click **Next**.

   The **Configure Server Start Mode and JDK** screen is displayed.

6. Select Production Mode and a valid JDK.

   Click **Next**.

   The **Optional Configuration** screen is displayed.

7. Click **Next**.

   The **Configuration Summary** screen is displayed.

8. Verify the domain details and click **Create**.

   The **Creating Domain** Screen is displayed.

9. When the domain creation process completes, click **Done** to close the Configuration Wizard.

   On Windows systems, to start the Administration Server after closing the Configuration Wizard, select the **Start Admin Server** check box. This check box is not available on UNIX and Linux systems.

2.3.4 Accessing Oracle Directory Services Manager (ODSM) for Oracle WebLogic Server

When you have created the WebLogic domain, as described previously, you can start the Administration Server, and access ODSM through a browser. The following section outlines the process on a UNIX and Linux systems.

1. Run the script to start the Administration Server from the following location:

   ```
   $ domain-home/bin/startWebLogic.sh
   ```

   where *domain-home* is the domain that you created in Step 4 of the previous procedure. For example:

   ```
   $ OUD-Base-Location-Home/user_projects/domains/base_domain/bin/startWebLogic.sh
   ```

   On Windows systems, run *domain_home*\startWebLogic.cmd.

   The user name and password that are requested here correspond to those in Step 5 of the previous procedure.

2. Access ODSM through a browser, using the following URL:

   ```
   http://hostname:7001/odsm
   ```

   where *hostname* is the name of the server on which WebLogic Server is installed. 7001 is the default administrative port for the WebLogic Administration Server.

   Note: Ensure that the Administration Server is up and running before you access ODSM. When the server successfully completes its startup process, it displays the following message:

   ```
   <Notice> <WebLogicServer> <BEA-000360> <Server started in
   RUNNING mode>
   ```

2.4 Configuring Oracle Unified Directory with Oracle Directory Integration Platform

Oracle Directory Integration Platform is a Java EE application that enables you to integrate your applications and directories, including third-party LDAP directories, with Oracle Unified Directory.

Oracle Directory Integration Platform includes services and interfaces that allow you to deploy synchronization solutions with other enterprise repositories. It can also be used to provide Oracle Unified Directory interoperability with third party metadirectory solutions.

For example, in an Oracle Fusion Middleware environment, where access to Oracle components relies on data stored in an Oracle directory, you can still use Microsoft

Active Directory as the central enterprise directory. Users of that directory can still access Oracle components because Oracle Directory Integration Platform can synchronize the data in Microsoft Active Directory with that in Oracle Unified Directory.

To configure Oracle Unified Directory, Oracle Directory Services Manager, Oracle Directory Integration Platform, and Fusion Middleware Control in an Oracle WebLogic Server domain, see the *Oracle Fusion Middleware Installation Guide for Oracle Identity Management*.

3

Setting Up Oracle Unified Directory as a Directory Server

This chapter describes how to set up an Oracle Unified Directory LDAP directory server instance using either the graphical user interface (GUI) or the command-line interface (CLI).

This chapter includes the following sections:

Before you set up an LDAP directory server instance, you must have already installed the software, as described in Chapter 2, "Installing the Oracle Unified Directory Software."

3.1 Setting Up the Directory Server Using the Graphical User Interface (GUI)

The graphical user interface (GUI) install uses a Java-based graphical installer that enables you to set up the directory server, load it with data, and get it running in very little time.

The installer asks some basic questions about the server configuration and then gives you the choice of leaving your database empty, loading the server with data from your own LDIF or loading the server with automatically generated sample data. The installer also enables you to configure security and replication, and, optionally, to start the server when the configuration is complete.

To setup a directory server instance using the `oud-setup` graphical user interface (GUI):

1. When you have installed the software, change to the `ORACLE_HOME` subdirectory.

   On UNIX and Linux systems:

   ```
   $ cd OUD-base-location/ORACLE_HOME
   ```

   On Windows systems:

   ```
   C:\> cd OUD-base-location\ORACLE_HOME
   ```

2. Ensure that your JAVA_HOME environment variable is set to a supported JVM installation (JRE 7 or JDK 7).

3. Run the oud-setup command to configure the directory server installation.

   On UNIX and Linux systems:

   ```
   $ oud-setup
   ```

   On Windows systems:

   ```
   C:\OUD-base-location\ORACLE_HOME> oud-setup.bat
   ```

   The utility launches the graphical installer and creates the Oracle Unified Directory instance in OUD-base-location/instance-dir.

   The default instance directory name is asinst_1, with subsequent instances on the same server named asinst_2, asinst_3, and so on. To specify a different instance name, set the INSTANCE_NAME environment variable before you run the setup, for example:

   ```
   $ export INSTANCE_NAME=my-oud-instance
   ```

   The instance is created directly under OUD-base-location by default. To change the instance path, include the path relative to OUD-base-location when you set the INSTANCE_NAME variable. For example:

   ```
   $ export INSTANCE_NAME=../../local/my-oud-instance
   ```

4. On the Welcome screen, click **Next**.

   The **Server Settings** screen is displayed.

5. Enter the following information:

   ■ **Host Name**: Enter the directory server's host name or IP address.

     The default is the local host name.

   ■ **LDAP Listener Port**: Enter the LDAP port for the directory server.

     The default port that is proposed is the first available port that ends with 389. On UNIX and Linux systems, if you run the installer as a non-root user, the default is 1389, if available.

   ■ **Administration Connector Port**: Enter the port that will be used for administration traffic.

     The default administration port is 4444. For more information about managing administration traffic to the server, see *Oracle Fusion Middleware Administering Oracle Unified Directory*.

   ■ **LDAP Secure Access**: To configure SSL, StartTLS, or both, then click **Configure**.

     Complete the following information:

     SSL Access: Select Enable SSL to indicate that the LDAPS (that is, LDAP over SSL) listener should be enabled. Enter the port number on which the directory server listens for connections.

     The default secure port that is proposed is the first available port that ends with 636. On UNIX and Linux systems, if you run the installer as a non-root user, the default secure port is 1636, if available.

StartTLS Access: Select **Enable StartTLS for LDAP** to specify that the LDAP connection handler should allow clients to use the StartTLS extended operation to initiate secure communication over an otherwise insecure connection.

Certificate: Select one of the following radio buttons to obtain the certificate that the server should use for SSL, StartTLS, or both:

Generate Self-Signed Certificate generates a self-signed certificate that you can use to secure the communication. While this option is convenient for testing purposes, many clients will not trust the certificate by default, and you might need to configure it manually.

Use an Existing Certificate uses a certificate in an existing JKS keystore, a PKCS #12 file, or a PKCS #11 token. For more information about obtaining and managing certificates, see the *Oracle Fusion Middleware Administering Oracle Unified Directory*.

For production servers, select **Use an Existing Certificate**, and then select the Keystore Type. Enter the Keystore Path, and Keystore PIN if necessary.

If more than one certificate is defined in the specified key store, you are asked to select one of the certificates from a drop down menu.

Click **OK**.

- **Root User DN**: Enter the Root User DN, or keep the default, `cn=Directory Manager`.

- **Password**: Enter the root user bind password.

- **Password (confirm)**: Retype the root user bind password.

Click **Next**.

The **Topology Options** screen is displayed.

6. Select one of the following:

   - **This will be a stand-alone server**.

   - **This server will be part of a replication topology**.

     For instructions on setting up a replicated topology, see Section 3.3, "Setting Up Replication During Installation."

Click **Next**.

The **Directory Data** screen is displayed.

7. Specify how to load data into your directory:

   - **Directory Base DN**: Enter the base DN for your directory.

     The default Base DN is `dc=example,dc=com`.

   - **Directory Data**: Select one of the following data options:

     Only Create Base Entry: Creates an entry with the base DN specified previously.

     Leave Database Empty: Sets up a database but does not populate any entries.

     Import Data from LDIF File: Imports LDIF data from the file specified in the Path field.

     Import Automatically-Generated Sample Data: Generates the number of sample entries specified in the Number of User Entries field.

Click **Next**.

The **Oracle Components Integration** screen is displayed.

8. Select one of the following options. Some components appear in multiple options, with consecutive options adding additional components to the selection. The options are:

   - **No specific integration**: Select this option if you want a standard installation. This is the default option.

   - **Enable for DIP**: Select this option if you want this server instance to be enabled as a datastore for Oracle Directory Integration Platform (DIP) only.

   - **Enable for EBS (E-Business Suite), Database Net Services and DIP**: Select this option if you want this server instance to be enabled as a datastore for Oracle E-Business Suite (EBS), Oracle Database Net Services, and Oracle Directory Integration Platform (DIP).

   - **Enable for EUS (Enterprise User Security), EBS, Database Net Services and DIP**: Select this option if you want this server instance to be enabled as a datastore for Oracle Enterprise User Security (EUS), Oracle E-Business Suite (EBS), Oracle Database Net Services, and Oracle Directory Integration Platform (DIP).

     To enable a server instance for EUS, you must also have enabled SSL access, as described in the Server Settings screen in Step 5 of this procedure.

     The **Enable for Oracle Database Net Services** option causes this server to store the database connect identifiers.

     When you enable a server instance for Oracle Enterprise User Security (EUS), Oracle E-Business Suite (EBS), or Oracle Database Net Services, the following naming contexts are created on the instance:

     `cn=oraclecontext`

     `cn=oracleschemaversion`

     `cn=subschemasubentry`

     `cn=oraclecontext,`*baseDN*

These naming contexts are not created if you select DIP.

Click **Next**.

The **Server Tuning** screen is displayed.

9. The **Server Tuning** screen enables you to tune Oracle Unified Directory server by selecting one of these options:

   - Providing the specific memory to be dedicated to the server.

   - Explicitly providing the run-time settings (JVM arguments) to be used by the server and the off-line tools (`import-ldif`, `export-ldif`, `verify-index`, and `rebuild-index`).

Select one of the following options:

   - **Providing the Memory to be used for OUD**: Move the slider to select the memory you want to use for the server. The off-line tools will use the same heap size as you select for the server using this slider.

     To fully dedicate the machine, check **Dedicated Machine for OUD**.

     To reset any changes to the default values, click **Reset to Default**.

Notes:

- The **Providing the Memory to be used for OUD** option is available only if you are running the oud-setup script using a JVM with Java HotSpot (such as Oracle Java SE).

- To tune the server using the contents of an LDIF file, use the dstune utility after you run the oud-setup script. For more information about tuning, see *Oracle Fusion Middleware Administering Oracle Unified Directory*.

- **Providing Runtime Options**: Click **Change** to change any of the displayed values for the **Server Runtime Settings** or the **Offline Tools Runtime Settings**.

    To reset any changes to the default values, click **Reset to Default**.

    See also Section 7.3, "Configuring the Java Run-Time Settings During the Server Setup."

Click **Next**.

The **Review** screen is displayed.

10. Review your configuration.

    Select **Start Server when Configuration has Completed** to start the server after the directory server has been configured. On Windows systems, select **Start Server as a Windows service**, if desired.

    To display the equivalent command-line installation, select **Show Equivalent Command-Line** from the drop down menu at the top of the panel. This option displays the non-interactive commands that are run to set up the server with the specified configuration, and can be useful for scripting purposes.

11. Click **Finish**.

12. Click **Close**.

13. Test whether the directory server has been set up and started successfully by searching an entry in the directory. For example:

    On UNIX and Linux systems:

    ```
    instance-dir/OUD/bin/ldapsearch -h localhost -p 1389 \
      -D "cn=directory manager" -w my-password -b "dc=example,dc=com" \
      "(objectclass=*)"
    ```

    On Windows systems:

    ```
    instance-dir\OUD\bat\ldapsearch.bat -h localhost -p 1389 \
      -D "cn=directory manager" -w my-password -b "dc=example,dc=com" \
      "(objectclass=*)"
    ```

3.2 Setting Up the Directory Server Using the Command-Line Interface (CLI)

The command-line interface (CLI) install is either interactive or non-interactive. In a non-interactive installation, you can set up the server without user intervention. In interactive mode, you are prompted for the required information before the configuration begins.

You run the `oud-setup` script with the `--cli` option to set up a directory server instance using the command-line interface (CLI).

To setup a directory server instance using the CLI:

1. When you have installed the software, change to the `ORACLE_HOME` subdirectory.

   On UNIX and Linux systems:

   ```
   $ cd OUD-base-location/ORACLE_HOME
   ```

   On Windows systems:

   ```
   C:\> cd OUD-base-location\ORACLE_HOME
   ```

2. Ensure that your `JAVA_HOME` environment variable is set to a supported JVM installation.

3. Type `oud-setup` with the `--cli` option to launch the install in interactive mode.

   On UNIX and Linux systems:

   ```
   $ ./oud-setup --cli
   ```

   On Windows systems:

   ```
   C:\> oud-setup.bat -cli
   ```

   The utility launches the command-line installer and creates the Oracle Unified Directory instance in `OUD-base-location/instance-dir`.

   The default instance directory name is `asinst_1`, with subsequent instances on the same server named `asinst_2`, `asinst_3`, and so on. To specify a different instance name, set the `INSTANCE_NAME` environment variable before you run the setup, for example:

   ```
   $ export INSTANCE_NAME=my-oud-instance
   ```

   The instance is created directly under OUD-base-location by default. To change the instance path, include the path relative to OUD-base-location when you set the INSTANCE_NAME variable. For example:

   ```
   $ export INSTANCE_NAME=../../local/my-oud-instance
   ```

4. Enter the root user DN, or press Enter or Return to accept the default (`cn=Directory Manager`).

5. Provide a password for the root user and reenter the password to confirm it.

6. Enter the LDAP port number for your directory server, or press Enter or Return to accept the default.

   If you run the installer as the root user, the default port is 389. If you run the installer as a non-root user, the default port is 1389.

7. Enter the port number that will be used for administration traffic.

   The default administration port is `4444`. For more information, about managing administration traffic to the server, see *Oracle Fusion Middleware Administering Oracle Unified Directory*.

8. Press Enter or Return to create base DNs in the server, or enter no if you do not want to create base DNs.

9. Enter the base DN for the directory data, or press Enter or Return to accept the default.

The default Base DN is `dc=example,dc=com`.

10. Select one of the following options to set up the directory data:

   - `Only create the base entry` creates an entry with the base DN specified previously.

   - `Leave the database empty` sets up a database but does not populate any entries.

   - `Import data from an LDIF file` imports LDIF data from a file, specified in the following step.

   - `Load automatically-generated sample data` generates the number of sample entries specified in the following step.

11. Type `yes` to enable SSL and enter the port for LDAPS clients.

   If you run the installer as the root user, the default secure port is 636. If you run the installer as a non-root user, the default secure port is 1636.

12. Type `yes` to enable StartTLS.

13. If you enabled SSL or StartTLS in the previous steps, select the certificate type.

14. Select one of the following options to integrate Oracle Unified Directory with Oracle components:

   1) No integration

   2) DIP (Directory Integration Platform)

   3) Generic: Database Net Services, EBS and DIP

   4) EUS (Enterprise User Security), Database Net Services, EBS and DIP

   The same components appear in multiple options. These options enable the server instance to be enabled as a datastore for the specified components, as follows.

   - 2) DIP: Oracle Directory Integration Platform (DIP) only.

   - 3) Generic: Database Net Services, EBS and DIP: Oracle E-Business Suite (EBS), Oracle Database Net Services, and Oracle Directory Integration Platform (DIP).

   - 4) EUS (Enterprise User Security), Database Net Services, EBS and DIP: Oracle Enterprise User Security (EUS), Oracle E-Business Suite (EBS), Oracle Database Net Services, and Oracle Directory Integration Platform (DIP).

     To integrate the server with EUS, you must also have enabled SSL access, as described in Step 11.

   When you enable a server instance for Oracle Enterprise User Security (EUS), Oracle E-Business Suite (EBS), or Oracle Database Net Services, the following naming contexts are created on the instance:

   `cn=oraclecontext`

   `cn=oracleschemaversion`

   `cn=subschemasubentry`

   `cn=oraclecontext,baseDN`

   These naming contexts are not created for DIP.

15. Enter an option depending on how you want to tune the Oracle Unified Directory server:

1) Use specific Java Virtual Machine arguments

2) Use the default Java Virtual Machine settings

3) Provide the Java heap size to be used by the server

4) Provide the percentage of system memory to be used by the server

5) Provide the size of system memory to be used by the server

---

Notes:

- Option 2 (default JVM settings) are based on the free memory of the system.

- Options 3, 4, and 5 are available only if you are running the `oud-setup` script using a JVM with Java HotSpot (such as Oracle Java SE).

---

16. Enter an option depending on how you want to tune the off-line tools (`import-ldif`, `export-ldif`, `verify-index`, and `rebuild-index`):

    1) Use specific Java Virtual Machine arguments

    2) Use the default Java Virtual Machine settings

    3) Automatic Tuning

    4) Provide the Java heap size to be used by the off-line tools

    Select the `Automatic Tuning` option, if you want the off-line tools to be tuned automatically each time they are launched, depending on the system resources.

17. Type `yes` or press Enter or Return to accept the default to start the server after the configuration has completed.

18. Confirm your configuration, and enter `1` or press Enter or Return to accept the default to complete the configuration process.

    To display the equivalent non-interactive commands, enter `3`. This option displays the commands that are run to set up the server with the specified configuration, and can be useful for scripting purposes.

19. Test whether the directory server has been set up and started successfully by searching an entry in the directory. For example:

    On UNIX and Linux systems:

    ```
    instance-dir/OUD/bin/ldapsearch -h localhost -p 1389 \
      -D "cn=directory manager" -w my-password -b "dc=example,dc=com" \
      "(objectclass=*)"
    ```

    On Windows systems:

    ```
    instance-dir\OUD\bat\ldapsearch.bat -h localhost -p 1389 \
      -D "cn=directory manager" -w my-password -b "dc=example,dc=com" \
      "(objectclass=*)"
    ```

3.3 Setting Up Replication During Installation

If you install the directory server using the GUI, you can set up replication as part of the installation. If you install the server using the command-line interface, you must set up replication using the `dsreplication` command after the server is installed. For

more information about configuring data replication with `dsreplication`, see *Oracle Fusion Middleware Administering Oracle Unified Directory*.

1. For the first directory server in your replication topology, follow the instructions in Section 3.1, "Setting Up the Directory Server Using the Graphical User Interface (GUI)."

2. On the Topologies screen, do the following:

   - Select **This server will be part of a replication topology**.

   - Enter the replication port number or accept the default port `8989`.

     The replication port must be an available port on the server, and must therefore be different for each directory server in a topology if all of them are running on the same host.

   - Select **Configure as Secure** to use encrypted communication when connecting to the replication port on the first server.

     Note the host name, and administration port, for this first directory server. You will need this information when you configure the second directory server.

3. Complete the configuration of the first server.

4. For the second directory server in your replication topology, follow the instructions in Section 3.1, "Setting Up the Directory Server Using the Graphical User Interface (GUI)."

5. On the Topologies screen, do the following:

   - Select **This server will be part of a replication topology**.

   - Enter the replication port number for this directory server.

     The replication port must be different from the replication port of the first directory server if both servers are running on the same host.

   - Select **There is already a server in the topology** and enter the following:

     a. **Host Name**: Enter the Host Name for the first directory server.

     b. **Port**: Enter the administration port for the first directory server.

     c. **Admin User**: Enter the bind DN for the first directory user, or accept the default.

     d. **Admin Password**: Enter the bind password for the Admin user.

6. On the Global Administrator screen, provide the following information:

   - The UID for the new global administrator.

   - The password for the new global administrator.

   - Confirm the password for the new global administrator.

7. On the Data Replication screen, select one of the following options, and click **Next**.

   a. Create first instance of base DN to be replicated.

   b. Create local instance of existing base DNs and configure replication. Click the base DN for the first directory server.

8. Review the configuration settings for the second server, and click **Finish**.

9. Repeat the above procedures to set up additional servers in the replication topology.

When you have defined the Global Administrator, the entry with the DN and the password that you provided in step 5c must be defined on all servers in the topology.

4

Setting Up Oracle Unified Directory as a Proxy Server

This chapter describes how to set up an Oracle Unified Directory proxy server instance using either the graphical user interface (GUI) or the command-line interface (CLI).

This chapter includes the following sections:

The chapter provides an overview of the supported Oracle Unified Directory proxy deployments. For example deployments using the proxy server, see *Oracle Fusion Middleware Administering Oracle Unified Directory*.

4.1 Before You Set up the Oracle Unified Directory Proxy

To set up the Oracle Unified Directory proxy, you must have one or more remote LDAPv3-compliant directory servers. Oracle Unified Directory proxy has been tested with Oracle Unified Directory and Oracle Directory Server Enterprise Edition 11g Release 1 (11.1.1).

Before you start to set up the proxy, determine the type of deployment architecture that you want to implement from the following list:

- Simple load balancing

- Simple distribution

- Distribution with load balancing

- Failover between data centers

- Distribution with failover between data centers

A global index catalog can be incorporated into any scenario that uses distribution. For information about creating a global index catalog, see *Oracle Fusion Middleware Administering Oracle Unified Directory*.

4.2 Setting Up the Proxy Server Using the Graphical User Interface (GUI)

The GUI setup is a Java-based graphical installer that enables you to configure all the elements required for specific Oracle Unified Directory proxy deployments.

You can use the GUI setup only once per instance. To modify an installation after you have run the GUI setup, use the `dsconfig` command.

The following topics present a step-by-step installation using the `oud-proxy-setup` graphical interface, including configuration examples for simple deployments:

- Section 4.2.1, "Presentation of the GUI Setup Wizard"

- Section 4.2.2, "To Configure Simple Load Balancing"

- Section 4.2.3, "To Configure Simple Distribution"

- Section 4.2.4, "To Configure Distribution with Load Balancing"

- Section 4.2.5, "To Configure Enterprise User Security (EUS)"

Before you run the GUI setup, determine the best deployment architecture using the deployment scenarios described in "Example Deployments Using the Proxy Server" in the *Oracle Fusion Middleware Administering Oracle Unified Directory*.

4.2.1 Presentation of the GUI Setup Wizard

The GUI setup wizard is organized as follows:

- The left hand pane lists the steps of the setup process. The deployment sub-steps change, according to the type of deployment that you select.

- The arrow in the left hand pane indicates the current step.

- The main area on the right is the action pane, where you define your deployment.

- At the bottom of the window you have the option to go back and forth (or quit) to modify and complete your installation.

The remaining tasks in this section walk you through the various types of proxy deployments that can be set up.

4.2.2 To Configure Simple Load Balancing

1. When you have installed the software, change to the ORACLE_HOME subdirectory.

    On UNIX and Linux systems:

    ```
    $ cd OUD-base-location/ORACLE_HOME
    ```

    On Windows systems:

    ```
    C:\> cd OUD-base-location\ORACLE_HOME
    ```

2. Ensure that your JAVA_HOME environment variable is set to a supported JVM installation (at least Java 1.6).

3. Run the `oud-proxy-setup` command to configure the proxy server installation.

    On UNIX and Linux systems:

    ```
    $ oud-proxy-setup
    ```

    On Windows systems:

    ```
    C:\> oud-proxy-setup.bat
    ```

The utility launches the graphical installer and creates the Oracle Unified Directory proxy instance in *OUD-base-location*/*instance-dir*.

The default instance directory name is `asinst_1`, with subsequent instances on the same server named `asinst_2`, `asinst_3`, and so on. To specify a different instance name, set the `INSTANCE_NAME` environment variable before you run the setup, for example:

```
$ export INSTANCE_NAME=my-oud-proxy-instance
```

The instance is created directly under OUD-base-location by default. To change the instance path, include the path relative to OUD-base-location when you set the INSTANCE_NAME variable. For example:

```
$ export INSTANCE_NAME=../../local/my-oud-proxy-instance
```

4. On the Welcome panel, click **Next**.

5. On the Server Settings panel, enter the following information:

   – **Host Name**: Enter the proxy server's host name or IP address.

     The default is the local host name.

   – **LDAP Listener Port**: Enter the LDAP port for the proxy server.

     The default port that is proposed is the first available port that ends with 389. On UNIX and Linux systems, if you run the installer as a non-root user, the default is 1389, if available.

   – **LDAP Secure Access**: To configure SSL, StartTLS, or both, click Configure.

     Complete the following information:

     a. **SSL Access**: Select Enable SSL and enter a valid port for secure LDAP operations.

        The default secure port that is proposed is the first available port that ends with `636`. On UNIX and Linux systems, if you run the installer as a non-root user, the default is `1636`, if available.

     b. **StartTLS Access**: Select Enable StartTLS for LDAP.

     c. **Certificate**: If you are in a testing environment, select Generate Self-Signed Certificate.

        For production servers, select **Use an Existing Certificate**, and then select the Keystore Type. Enter the Keystore Path, and Keystore PIN if necessary.

     d. Click **OK** to continue.

   – **Administration Port**: Enter the port that will be used for administration traffic.

     The default administration port is `4444`. For more information about managing administration traffic to the server, see *Oracle Fusion Middleware Administering Oracle Unified Directory*.

   – **Root User DN**: Enter the Root User DN, or keep the default, `cn=Directory Manager`.

   – **Password**: Enter the root user bind password.

   – **Password (confirm)**: Reenter the root user bind password.

   Click **Next**.

The **Deployment Options** screen is displayed.

6. Select **Use load balancing on a replicated data set** from the Configuration Option drop-down menu.

> **Note:** If you select **Configure later**, only the server settings that you specified in the previous step are configured. You must then use the `dsconfig` command, or the ODSM interface, to configure your deployment.

Click **Next**.

The **Back-End Servers** screen is displayed.

7. Select the remote LDAP servers that hold the corresponding replicated data.

   a. If your remote LDAP servers are Oracle Unified Directory servers or Oracle Directory Server Enterprise Edition servers, click Add Oracle Servers.

   – For Oracle Unified Directory servers:

   Select **Connect to a replicated Oracle Unified Directory server**.

   Enter the host name, administration port, administration bind DN, and password for the remote Oracle Unified Directory server.

   Click **Connect**.

   Accept the certificate.

   Check the servers that should be part of the load balanced topology.

   When you have entered the details of one directory server in a replicated topology, the setup wizard displays all other replicated servers in that topology.

   Click **OK**.

   – For Oracle Directory Server Enterprise Edition servers:

   Select **Connect to a DSCC registry**.

   Enter the DSCC host name, DSCC port, protocol, and the Directory Service Manager credentials for the DSCC registry.

   Check the servers that should be part of the load balanced topology.

   The setup wizard displays all the Oracle Directory Server Enterprise Edition server instances that are registered in the DSCC registry.

   Click **OK**.

   b. If your remote LDAP servers are not Oracle Unified Directory servers or Oracle Directory Server Enterprise Edition servers, click Add Server.

   – Enter the server name, port and security settings.

   The security settings you set here will determine the security between the Oracle Unified Directory proxy and remote LDAP servers. For more information about setting security options, see *Oracle Fusion Middleware Administering Oracle Unified Directory*.

   – Click **Add**.

- – Click **Close** when you have added all the remote LDAP servers for the load balanced topology.

    Click **Next**.

    The **Load Balancing Options** screen is displayed.

8. Choose a load balancing algorithm.

For information about the various load balancing algorithms, see *Oracle Fusion Middleware Administering Oracle Unified Directory*.

9. Set the load balancing algorithm properties or select Default Values.

When you have completed the installation, the properties can be modified. For more information about modifying load balancing properties, see *Oracle Fusion Middleware Administering Oracle Unified Directory*.

a. For proportional, set the weight. Requests are distributed between the remote LDAP servers based on the weight indicated.

For example, if you leave the default value of 1, then all servers will receive the same number of requests.

b. For failover, indicate the order in which the servers are used.

The server with a value of 0 is the highest priority server. The other servers are used only if there is a failure on the main server.

c. For saturation, set the order in which the servers are used and the saturation threshold of each server.

Requests are sent to the server with the highest priority (1) until it reaches the threshold indicated. The saturation threshold is the rate at which the server is considered saturated, or full. Typically this limit should be set lower than 100%.

d. For optimal, no additional configuration is required.

The active server is selected based on the saturation index, which is calculated automatically.

10. Enter the naming context, or suffix.

If the remote LDAP servers are online, the setup connects to them and displays the naming contexts that are available on the servers.

If no naming contexts are proposed, enter the DN of the naming context that you want to use, for example, dc=example,dc=com.

Click **Next**.

The **Runtime options** screen is displayed.

11. Click **Change** to configure any specific JVM settings, or click **Next** to run the server with the default JVM settings.

The **Review** screen is displayed.

12. Review the installation configuration.

If you need to make any modifications, use the **Previous** button.

13. To display the commands that will be launched for this installation, select Show Command from the drop down menu.

These commands are saved in a log file, in the logs folder. You can use these commands to run additional installations with similar deployment options later.

14. Click **Finish** to complete the installation.

When the installation is complete, you can use the dsconfig command to modify the installation. For more information, see *Oracle Fusion Middleware Administering Oracle Unified Directory*.

4.2.3 To Configure Simple Distribution

1. When you have installed the software, change to the ORACLE_HOME subdirectory.

On UNIX and Linux systems:

```
$ cd OUD-base-location/ORACLE_HOME
```

On Windows systems:

```
C:\> cd OUD-base-location\ORACLE_HOME
```

2. Ensure that your JAVA_HOME environment variable is set to a supported JVM installation (at least Java 1.6).

3. Run the oud-proxy-setup command to configure the proxy server installation.

On UNIX and Linux systems:

```
$ oud-proxy-setup
```

On Windows systems:

```
C:\> oud-proxy-setup.bat
```

The utility launches the graphical installer and creates the Oracle Unified Directory proxy instance in *OUD-base-location/instance-dir*.

The default instance directory name is asinst_1, with subsequent instances on the same server named asinst_2, asinst_3, and so on. To specify a different instance name, set the INSTANCE_NAME environment variable before you run the setup, for example:

```
$ export INSTANCE_NAME=my-oud-proxy-instance
```

The instance is created directly under OUD-base-location by default. To change the instance path, include the path relative to OUD-base-location when you set the INSTANCE_NAME variable. For example:

```
$ export INSTANCE_NAME=../../local/my-oud-proxy-instance
```

4. On the Welcome panel, click **Next**.

5. On the Server Settings screen, enter the following information:

- **Host Name**: Enter the proxy server's host name or IP address.

  The default is the local host name.

- **LDAP Listener Port**: Enter the LDAP port for the proxy server.

  The default port that is proposed is the first available port that ends with **389**. On UNIX and Linux systems, if you run the installer as a non-root user, the default is 1389, if available.

- **LDAP Secure Access**: To configure SSL, StartTLS, or both, click **Configure**.

  Complete the following information:

    a. **SSL Access**: Select Enable SSL and enter a valid port for secure LDAP operations.

    The default secure port that is proposed is the first available port that ends with `636`. On UNIX and Linux systems, if you run the installer as a non-root user, the default is `1636`, if available.

    b. **StartTLS Access**: Click **Enable StartTLS** for **LDAP**.

    c. **Certificate**: If you are in a testing environment, select **Generate Self-Signed Certificate**.

    For production servers, click **Use an Existing Certificate**, and then click the **Keystore Type**. Enter the Keystore Path, and Keystore PIN if necessary.

    d. Click **OK**.

- **Administration Port**: Enter the port that will be used for administration traffic.

  The default administration port is `4444`. For more information about managing administration traffic to the server, see *Oracle Fusion Middleware Administering Oracle Unified Directory*.

- **Root User DN**: Enter the Root User DN, or keep the default, `cn=Directory Manager`.

- **Password**: Enter the root user bind password.

- **Password (confirm)**: Retype the root user bind password.

- Click **Next**.

6. In the Deployment Options panel, select Use distribution on a partitioned data set from the Configuration Option drop-down menu.

If you select **Configure later**, only the server settings that you specified in the previous step are configured. You must then use the `dsconfig` command or the ODSM interface to configure your deployment.

7. Drag the sliding arrow to specify the number of partitions on which the data is separated.

For the example distribution scenario, select two partitions.

Click **Next**.

8. Define how the data will be partitioned across the LDAP servers.

    a. Select the Partitioning Algorithm from the drop-down list.

    For information about the various partitioning algorithms and distribution using the proxy, see *Oracle Fusion Middleware Administering Oracle Unified Directory*.

    b. Enter the naming context.

    For example, `dc=example,dc=com`.

    c. Enter the distribution base DN.

    For example, `ou=people`. The distribution base DN is the level after which the distribution requests apply.

    d. If you have selected a Lexico or Numeric algorithm, enter the distribution attribute.

For example, `uid`.

9. Depending on the distribution algorithm, define the partition capacities, DN patterns, or boundaries for each partition.

If you use the Set Default button, the installation wizard sets defaults that might not correspond to your deployment. This feature can, however, be useful for testing purposes.

a. For capacity, set the maximum number of entries for each partition.

For example, if you set maximum entries to `1000`, only `1000` Add requests will be sent to the LDAP server associated with that partition. If you set maximum entries to `1000` for partition `1` and `2000` for partition `2`, the proxy will send twice the number of requests to partition `2`.

Note: If you select the capacity algorithm, you **must** create a global index, as described in the next step.

---

b. For DN pattern, set the DN pattern string for each partition.

For example, `cn=[a].*` means that requests with a `uid` that starts with `a` will be sent to partition 1. For more information about DN pattern strings, see *Oracle Fusion Middleware Administering Oracle Unified Directory*.

c. For lexico, set the alphabetic boundaries for each partition.

For example, for partition 1, `From=A, To=K`. Then, `uids` with values between A and K will be sent to partition 1.

d. For numeric, set numeric boundaries for each partition.

For example, for partition 1, `From=0, To=1000`. Then, `uids` between 0 and 1000 will be sent to partition 1.

Note: The upper boundary is exclusive. That is, if you set the upper boundary to 1000, only entries up to 999 will be distributed to that partition.

If you leave one of the boundaries blank, this will be considered as `unlimited`. In other words, if you set the lower boundary to 1000 and the upper boundary to blank, the partition will include everything after 1000.

Click **Next**.

10. Configure the global index.

a. Select **Enable Global Indexes**.

If you have selected a capacity algorithm, this option will already be selected because Global indexes are **mandatory** for the capacity algorithm.

b. Add attributes to be indexed:

– Select Index the DNs if you want the DNs included in the global index.

– Select Index other attributes if you want attributes other than the DNs included.

      – Select attributes from the Available Attributes list and click Add to include those attributes in the global index.

      All available attributes are listed. Choose only those attributes that contain unique values.

      If necessary, use the `split-ldif` command to divide LDIF files into files containing the expected data for global indexes. For more information about global indexes, see *Oracle Fusion Middleware Administering Oracle Unified Directory*.

The installation wizard creates a global index catalog, named `gi-catalog` by default, and populates the global index catalog with global indexes of the selected attributes. All global indexes are associated with the same global index catalog (`gi-catalog`). The installation wizard also creates a global index replication administrator with the same password as the directory manager.

For information about configuring and using global indexes, *Oracle Fusion Middleware Administering Oracle Unified Directory*.

11. For each partition, select the remote LDAP server that holds the corresponding partitioned data.

> **Note:** If you add two servers for one partition, you must configure load balancing between these servers. This use case is explained in the example To Configure Distribution with Load Balancing.

    a. If your remote LDAP servers are Oracle Unified Directory servers or Oracle Directory Server Enterprise Edition servers, click Add Oracle Servers.

    For Oracle Unified Directory servers:

    a. Select **Connect to a replicated Oracle Unified Directory server**.

    b. Enter the host name, administration port, administration bind DN, and password for the remote Oracle Unified Directory server.

    c. Click **Connect**.

    d. Accept the certificate.

    Check the servers that should be part of the load balanced topology.

    When you have entered the details of one directory server in a replicated topology, the setup wizard displays all other replicated servers in that topology.

    e. Click **OK**.

    For Oracle Directory Server Enterprise Edition servers:

    a. Select **Connect to a DSCC registry**.

    b. Enter the DSCC host name, DSCC port, protocol, and the Directory Service Manager credentials for the DSCC registry.

    c. Check the servers that should be part of the load balanced topology.

    The setup wizard displays all the Oracle Directory Server Enterprise Edition server instances that are registered in the DSCC registry.

    d. Click **OK**.

    b. If your remote LDAP servers are not Oracle Unified Directory servers or Oracle Directory Server Enterprise Edition servers, click Add Server.

        a. Enter the server name, port and security settings.

        The security settings that you set here determine the security between the Oracle Unified Directory proxy and remote LDAP servers. For more information about setting security options between the proxy and the data source, see *Oracle Fusion Middleware Administering Oracle Unified Directory*.

        b. Click **Add**.

        c. Click **Close** when you have added all the remote LDAP servers for the distributed topology.

12. On the Runtime options panel, click Change to configure any specific JVM setting, or click Next to run the server with the default JVM settings.

13. Review the installation configuration.

    If you need to make any modifications, use the Previous button.

14. To display the commands that will be launched for this installation, select Show Command from the drop down menu.

    These commands are saved in a log file, in the logs folder. You can use these commands to run additional installations with similar deployment options later.

15. Click **Finish** to complete the installation.

    When the installation is complete, you can use the `dsconfig` command to modify the installation. For more information about managing the server configuration with `dsconfig`, see *Oracle Fusion Middleware Administering Oracle Unified Directory*.

4.2.4 To Configure Distribution with Load Balancing

1. When you have installed the software, change to the `ORACLE_HOME` subdirectory.

    On UNIX and Linux systems:

```
$ cd OUD-base-location/ORACLE_HOME
```

    On Windows systems:

```
C:\> cd OUD-base-location\ORACLE_HOME
```

2. Ensure that your `JAVA_HOME` environment variable is set to a supported JVM installation (at least Java 1.6).

3. Run the `oud-proxy-setup` command to configure the proxy server installation.

    On UNIX and Linux systems:

```
$ oud-proxy-setup
```

    On Windows systems:

```
C:\> oud-proxy-setup.bat
```

    The utility launches the graphical installer and creates the Oracle Unified Directory proxy instance in *OUD-base-location/instance-dir*.

    The default instance directory name is `asinst_1`, with subsequent instances on the same server named `asinst_2`, `asinst_3`, and so on. To specify a different instance

name, set the `INSTANCE_NAME` environment variable before you run the setup, for example:

```
$ export INSTANCE_NAME=my-oud-proxy-instance
```

The instance is created directly under OUD-base-location by default. To change the instance path, include the path relative to OUD-base-location when you set the INSTANCE_NAME variable. For example:

```
$ export INSTANCE_NAME=../../local/my-oud-proxy-instance
```

4. On the Welcome panel, click **Next**.

5. On the Server Settings panel, enter the following information:

    –   **Host Name**: Enter the proxy server's host name or IP address.

        The default is the local host name.

    –   **LDAP Listener Port**: Enter the LDAP port for the proxy server.

        The default port that is proposed is the first available port that ends with `389`. On UNIX and Linux systems, if you run the installer as a non-root user, the default is `1389`, if available.

    –   **LDAP Secure Access**: To configure SSL, StartTLS, or both, click **Configure**.

        Complete the following information:

        a.   **SSL Access**: Select Enable SSL and enter a valid port for secure LDAP operations.

             The default secure port that is proposed is the first available port that ends with `636`. On UNIX and Linux systems, if you run the installer as a non-root user, the default is `1636`, if available.

        b.   **StartTLS Access**: Click **Enable StartTLS for LDAP**.

        c.   **Certificate**: If you are in a testing environment, select Generate Self-Signed Certificate.

             For production servers, click **Use an Existing Certificate**, and then select the Keystore Type. Enter the Keystore Path, and Keystore PIN if necessary.

        d.   Click **OK**.

    –   **Administration Port**: Enter the port that will be used for administration traffic.

        The default administration port is `4444`. For more information about managing administration traffic to the server, see *Oracle Fusion Middleware Administering Oracle Unified Directory*.

    –   **Root User DN**: Enter the Root User DN, or keep the default, `cn=Directory Manager`.

    –   **Password**: Enter the root user bind password.

    –   **Password (confirm)**: Retype the root user bind password.

    Click **Next** to continue.

    The **Deployment Options** screen is displayed.

6. Select **Use distribution on a partitioned data set** from the Configuration Option drop-down menu.

If you select **Configure later**, only the server settings that you specified in the previous step are configured. You must then use the dsconfig command or the ODSM interface to configure your deployment.

7. Drag the sliding arrow to specify the number of partitions on which the data is separated.

   For the example distribution scenario, select two partitions.

   Click **Next**.

8. Define how the data will be partitioned across the LDAP servers.

   a. Select the Partitioning Algorithm from the drop-down list.

      For information about the various partitioning algorithms for the proxy, see *Oracle Fusion Middleware Administering Oracle Unified Directory*.

   b. Enter the naming context.

      For example, dc=example,dc=com.

   c. Enter the distribution base DN.

      For example, ou=people. The distribution base DN is the level after which the distribution requests apply.

   d. If you have selected a Lexico or Numeric algorithm, enter the distribution attribute.

      For example,uid.

9. Depending on the distribution algorithm, define the partition capacities, DN patterns, or boundaries for each partition.

   If you use the Set Default button, the installation wizard sets defaults, that might not correspond to your deployment. This feature can, however, be useful for testing purposes.

   a. For capacity, set the maximum number of entries for each partition.

      For example, if you set maximum entries to 1000, only 1000 Add requests will be sent to the LDAP server associated with that partition. If you set maximum entries to 1000 for partition 1 and 2000 for partition 2, the proxy will send twice the number of requests to partition 2.

      If you select the capacity algorithm, you must create a global index, as described in the next step.

   b. For DN pattern, set the DN pattern string for each partition.

      For example, cn=[a].* means that requests with a uid that starts with a will be sent to partition 1. For more information about DN pattern strings, see *Oracle Fusion Middleware Administering Oracle Unified Directory*.

   c. For lexico, set the alphabetic boundaries for each partition.

      For example, for partition 1, From=A, To=K. Then, uids with values between A and K will be sent to partition 1.

   d. For numeric, set numeric boundaries for each partition.

      For example, for partition 1, From=0, To=1000. Then, uids between 0 and 1000 will be sent to partition 1.

      The upper boundary is exclusive. That is, if you set the upper boundary to 1000, only entries up to 999 will be distributed to that partition.

If you leave one of the boundaries blank, this will be considered as `unlimited`. In other words, if you set the lower boundary to 1000 and the upper boundary to blank, the partition will include everything after 1000.

Click **Next**.

10. Configure the global index.

    a. Select **Enable Global Indexes**.

       If you have selected a capacity algorithm, this option will already be selected because Global indexes are **mandatory** for the capacity algorithm.

    b. Add attributes to be indexed:

       a. Select Index the DNs if you want the DNs included in the global index.

       b. Select Index other attributes if you want attributes other than the DNs included.

       c. Select attributes from the Available Attributes list and click Add to include those attributes in the global index.

          All available attributes are listed. Choose only those attributes that contain unique values.

          If necessary, use the `split-ldif` command to divide LDIF files into files containing the expected data for global indexes. For more information, see *Oracle Fusion Middleware Administering Oracle Unified Directory*.

       The installation wizard creates a global index catalog, named `gi-catalog` by default, and populates the global index catalog with global indexes of the selected attributes. All global indexes are associated with the same global index catalog (`gi-catalog`). The installation wizard also creates a global index replication administrator with the same password as the directory manager.

       For information about configuring and using global indexes, see *Oracle Fusion Middleware Administering Oracle Unified Directory*.

11. For each partition, select the remote LDAP server that holds the corresponding partitioned data.

    You must select at least two remote LDAP servers per partition to deploy distribution with load balancing.

    a. If your remote LDAP servers are Oracle Unified Directory servers or Oracle Directory Server Enterprise Edition servers, click Add Oracle Servers.

       For Oracle Unified Directory servers:

       a. Select **Connect to a replicated Oracle Unified Directory server**.

       b. Enter the host name, administration port, administration bind DN, and password for the remote Oracle Unified Directory server.

       c. Click **Connect**.

       d. Accept the certificate.

       e. Check the servers that should be part of the load balanced topology.

          When you have entered the details of one directory server in a replicated topology, the setup wizard displays all other replicated servers in that topology.

       f. Click **OK**.

For Oracle Directory Server Enterprise Edition servers:

   a. Select **Connect to a DSCC registry**.

   b. Enter the DSCC host name, DSCC port, protocol, and the Directory Service Manager credentials for the DSCC registry.

   c. Check the servers that should be part of the load balanced topology.

   The setup wizard displays all the Oracle Directory Server Enterprise Edition server instances that are registered in the DSCC registry.

   d. Click **OK**.

b. If your remote LDAP servers are not Oracle Unified Directory servers or Oracle Directory Server Enterprise Edition servers, click Add Server.

   a. Enter the server name, port and security settings.

   The security settings you set here will determine the security between the Oracle Unified Directory proxy and remote LDAP servers. For more information about setting security options between the proxy and the data source, see *Oracle Fusion Middleware Administering Oracle Unified Directory*.

   b. Click **Add**.

   c. Click **Close** when you have added all the remote LDAP servers for the distributed topology.

12. For each partition, set load balancing.

   a. Choose the load balancing algorithm.

   For example, select **Proportional with default values**.

   b. Set the load balancing algorithm properties or select Default Values.

   When you have completed the installation, the properties can be modified. For more information about modifying load balancing properties, see *Oracle Fusion Middleware Administering Oracle Unified Directory*.

   – For proportional load balancing, set the weight. Requests are distributed between the remote LDAP servers based on the weight indicated.

   For example, if you leave the default value of 1, all servers will receive the same number of requests.

   – For failover, indicate the order in which the servers are used.

   The server with a value of 1 will be the main server. The other servers will only be used if there is a failure on the server with a priority of 1.

   – For saturation, set the order in which the servers are used and the saturation threshold of each server.

   Requests are sent to the server with the highest priority (1) until it reaches the threshold indicated. The saturation threshold is the rate at which the server is considered saturated, or full. Typically this limit should be set lower than 100%.

   – For optimal, no additional configuration is required.

   The active server is selected based on the saturation index, which is calculated automatically.

13. On the Runtime options panel, click **Change** to configure any specific JVM setting, or click **Next** to run the server with the default JVM settings.

For more information, see Configuring the Java Run-Time Settings During the Server Setup.

The **Review** screen is displayed.

14. Review the installation configuration.

If you need to make any modifications, use the **Previous** button.

15. To display the commands that will be launched for this installation, select **Show Command** from the drop down menu.

These commands are saved in a log file, in the logs folder. You can use these commands to run additional installations with similar deployment options later.

16. Click **Finish** to complete the installation.

When the installation is complete, you can use the dsconfig command to modify the installation. For more information, see *Oracle Fusion Middleware Administering Oracle Unified Directory*.

4.2.5 To Configure Enterprise User Security (EUS)

After you have installed the Oracle Unified Directory software, as described in Chapter 2, "Installing the Oracle Unified Directory Software," you can configure the proxy instance to use Enterprise User Security (EUS).

For the configuration procedure, see *Oracle Fusion Middleware Administering Oracle Unified Directory*.

4.3 Setting Up the Proxy Using the Command-Line (CLI)

The interactive command-line setup prompts you for the first steps of an Oracle Unified Directory proxy installation. For example, running the oud-proxy-setup or oud-proxy-setup.bat script in command-line mode defines the proxy host name, proxy port, and security configuration.

To complete the deployment and to configure the proxy instance using dsconfig or ODSM, see the chapters in "Configuring Proxy, Distribution, and Virtualization Functionality" in *Oracle Fusion Middleware Administering Oracle Unified Directory*.

You can also use a common properties file to provide default values for options. For more information about using a properties file with server commands, see *Oracle Fusion Middleware Administering Oracle Unified Directory*.

4.3.1 To Set Up the Proxy Using the CLI

If you have previously used the graphical wizard to set up the proxy, you can copy the commands that are launched by the wizard before completing the installation. The commands displayed by the install wizard are a good starting point for scripting an installation. For more information, see Section 4.4, "Duplicating an Oracle Unified Directory Proxy Installation."

To set up a proxy using the CLI:

1. After you have installed the Oracle Unified Directory software, change to the ORACLE_HOME subdirectory.

On UNIX and Linux systems:

```
$ cd OUD-base-location/ORACLE_HOME
```

On Widows systems:

```
C:\> cd OUD-base-location\ORACLE_HOME
```

2. Ensure that your `JAVA_HOME` environment variable is set to a supported JVM installation (JDK 7 or JRE 7).

3. Enter the `oud-proxy-setup` command with the `--cli` option, specifying the server details as follows:

On UNIX and Linux systems:

```
$ oud-proxy-setup --cli -p 1389 --adminConnectorPort 4444 -D
"cn=Directory Manager" -j pwd-file
```

On Windows systems:

```
C:\> oud-proxy-setup.bat -cli -p 1389  --adminConnectorPort 4444 -D
"cn=Directory Manager" -j pwd-file
```

In these examples, `-p` specifies the proxy LDAP port used to send data between the client and the proxy, `--adminConnectorPort` specifies the proxy administration port, `-D` specifies the bind DN, and `-j` specifies the file containing the proxy LDAP bind password.

The `oud-proxy-setup` command launches the setup script and creates the Oracle Unified Directory proxy instance in `OUD-base-location/instance-dir`.

The default instance directory is `asinst_1`, with subsequent instances on the same server named `asinst_2`, `asinst_3`, and so on. To specify a different instance name, set the `INSTANCE_NAME` environment variable before you run the script. For example:

```
$ export INSTANCE_NAME=my-oud-proxy-instance
```

The instance is created directly under `OUD-base-location` by default. To change the instance path, include the path relative to `OUD-base-location` when you set the INSTANCE_NAME variable. For example:

```
$ export INSTANCE_NAME=../../local/my-oud-proxy-instance
```

Note: To configure Enterprise User Security (EUS) in CLI mode, specify the following option when you run the setup script:

```
oud-proxy-setup --eusContext namingContext
```

For example:

```
$ oud-proxy-setup --eusContext dc=example,dc=com
```

---

4. To complete the proxy deployment, you must configure workflow elements, workflows, network group, and other required components.

These components depend on your deployment architecture. For examples based on supported use cases, see *Oracle Fusion Middleware Administering Oracle Unified Directory*.

4.4 Duplicating an Oracle Unified Directory Proxy Installation

To set up a replicated Oracle Unified Directory proxy, you must duplicate your Oracle Unified Directory proxy installation, as described in the following sections:

- Section 4.4.1, "Duplicating a Proxy Installation Using the GUI"
- Section 4.4.2, "Duplicating a Proxy Installation Using the Installation Log File"

4.4.1 Duplicating a Proxy Installation Using the GUI

If you are using the graphical install wizard to set up Oracle Unified Directory proxy, you can copy the commands that are launched by the wizard before completing the installation. The commands displayed by the install wizard are a good starting point for scripting an installation.

1. Using the graphical install wizard, define the proxy installation but do not click Finish.

2. On the Review page, select the Show Commands button from the top right.

3. Copy the commands that are displayed.

4. Paste them into a text file.

   You can now complete your first installation by clicking Finish.

5. Edit the commands to modify the port, the hostname, and the password.

   Replace the generic *asinst* variable with the appropriate instance name, either by anticipating the instance name, or by setting the INSTANCE_NAME variable. You might also need to quote certain arguments, depending on your shell scripting language.

6. Save the updated file as a script.

7. On the system where you want to host the next Oracle Unified Directory proxy instance, install the Oracle Unified Directory software, as described in Installing Oracle Unified Directory.

8. Change to the ORACLE_HOME subdirectory.

   On UNIX and Linux systems:

   ```
   $ cd OUD-base-location/ORACLE_HOME
   ```

   On Windows systems:

   ```
   C:\> cd OUD-base-location\ORACLE_HOME
   ```

9. Run the script that you saved in Step 5.

4.4.2 Duplicating a Proxy Installation Using the Installation Log File

When you have completed a proxy installation, a log file named oud-setup saves the commands of the installation. You can use this file to duplicate an Oracle Unified Directory proxy instance.

1. Change to the logs directory.

   ```
   $ cd OUD-base-location/instance-name/OUD/logs
   ```

2. Open the file oud-setup.

3. Edit the commands to modify the port, the hostname, and the password file of the new proxy instance.

   Replace the generic *asinst* variable with the appropriate instance name, either by anticipating the instance name, or by setting the INSTANCE_NAME variable. You might also need to quote certain arguments, depending on your shell scripting language.

4. Save the updated file as a script.

5. On the system where you want to host the next Oracle Unified Directory proxy instance, install the Oracle Unified Directory software, as described in Installing Oracle Unified Directory.

6. Change to the ORACLE_HOME subdirectory.

   On UNIX and Linux systems:

   ```
   $ cd OUD-base-location/ORACLE_HOME
   ```

   On Windows systems:

   ```
   C:\> cd OUD-base-location\ORACLE_HOME
   ```

7. Run the script that you saved in Step 4.

4.5 Ensuring Redundancy for Oracle Unified Directory

To avoid a single point of failure in your deployment, the proxy should be redundant. You can ensure redundancy by using multiple replicated proxy server instances. For more information about multiple replicated proxies, see *Oracle Fusion Middleware Administering Oracle Unified Directory*.

5

Setting Up Oracle Unified Directory as a Replication Gateway

This chapter describes how to set up an Oracle Unified Directory replication gateway using either the graphical user interface (GUI) or the command-line interface.

The replication gateway enables replication between Oracle Directory Server Enterprise Edition and Oracle Unified Directory. Its main purpose is to facilitate migration from an Oracle Directory Server Enterprise Edition deployment.

This chapter includes the following sections:

- Section 5.1, "Before You Set Up the Replication Gateway"
- Section 5.2, "Setting Up the Replication Gateway Using the Graphical User Interface (GUI)"
- Section 5.3, "Setting Up the Replication Gateway Using the Command-Line Interface (CLI)"
- Section 5.4, "Verifying the Replication Gateway Setup"

5.1 Before You Set Up the Replication Gateway

Before you set up a replication gateway instance, the following must be in place:

- The Oracle Unified Directory servers in the topology must be configured so that inconsistencies between the Oracle Directory Server Enterprise Edition configuration and the Oracle Unified Directory configuration are taken into account.

  Run the `ds2oud` command to configure the Oracle Unified Directory directory servers to coexist with Oracle Directory Server Enterprise Edition servers in a replicated topology. For more information, about replicating between Oracle Directory Server Enterprise Edition and Oracle Unified Directory, see *Oracle Fusion Middleware Administering Oracle Unified Directory*.

- The Oracle Directory Server Enterprise Edition servers that will be connected to the replication gateway must be configured for replication and must be master replicas.

  Replication *must* be enabled in Oracle Directory Server Enterprise Edition on the suffix that will be replicated. This is the case even if there is only one Oracle Directory Server Enterprise Edition server in the topology.

- The replication gateway setup attempts to contact the Oracle Unified Directory server and the Oracle Directory Server Enterprise Edition server. These servers must therefore be up and running.

5.2 Setting Up the Replication Gateway Using the Graphical User Interface (GUI)

The GUI setup uses a Java-based graphical installer that enables you to set up and configure the replication gateway.

To set up a replication gateway server instance using the graphical user interface:

1. When you have installed the software, change to the `OUD_ORACLE_HOME` subdirectory.

   On UNIX and Linux systems:

   ```
   $ cd OUD-base-location/OUD_ORACLE_HOME
   ```

   On Windows systems:

   ```
   C:\> cd OUD-base-location\OUD_ORACLE_HOME
   ```

2. Ensure that your `JAVA_HOME` environment variable is set to a supported JVM installation (at least Java 1.6).

3. Run the `oud-replication-gateway-setup` command to configure the replication gateway installation.

   On UNIX and Linux systems:

   ```
   $ oud-replication-gateway-setup
   ```

   On Windows systems:

   ```
   C:\> oud-replication-gateway-setup.bat
   ```

   The utility launches the graphical installer and creates the replication gateway instance in `OUD-base-location/instance-dir`.

   The default instance directory name is `asinst_1`, with subsequent instances on the same server named `asinst_2`, `asinst_3`, and so on. To specify a different instance name, set the `INSTANCE_NAME` environment variable before you run the setup, for example:

   ```
   $ export INSTANCE_NAME=my-oud-instance
   ```

4. On the Welcome screen, click **Next**.

   A confirmation message is displayed, requesting you to confirm that you have configured the Oracle Unified Directory directory servers to coexist with Oracle Directory Server Enterprise Edition servers in a replicated topology. If you have done this configuration, click **Yes**. If you have not, click **No**, exit the installer, and run the `ds2oud` command to perform the required configuration before you install the replication gateway.

   For more information, about replicating between Oracle Directory Server Enterprise Edition and Oracle Unified Directory, see *Oracle Fusion Middleware Administering Oracle Unified Directory*.

   The **Replication Gateway Administration** screen is displayed.

5. Enter the following information:

   - **Host Name**: Enter the host name or IP address for this replication gateway instance.

     The default is the local host name.

- **Administration Connector Port**: Enter the port that will be used for administration traffic.

  The default administration port is `4444`. For more information about managing administration traffic to the server, see *Oracle Fusion Middleware Administering Oracle Unified Directory*.

- **Root User DN**: Enter the Root User DN, or keep the default, `cn=Directory Manager`.

- **Password**: Enter the root user bind password.

- **Password (confirm)**: Retype the root user bind password.

Click **Next**.

The **ODSEE Server Settings** screen is displayed.

6. Enter the following information:

   - **Host Name**: Enter the ODSEE directory server's host name or IP address.

     The default is the local host name.

   - **Port**: Enter the LDAP port for the ODSEE directory server.

   - **Bind DN**: Enter the Bind DN that will be used to access the Oracle Directory Server Enterprise Edition server, or keep the default, `cn=Directory Manager`.

   - **Password**: Enter the bind password.

   - If the Oracle Unified Directory servers are read-only servers, uncheck the first check box. Otherwise, leave it checked.

   - To secure the traffic between the gateway and the Oracle Directory Server Enterprise Edition server:

     a. Check the Use SSL between ODSEE and Replication Gateway check box.

     b. Ensure that the Port you specified above is the secure port of the Oracle Directory Server Enterprise Edition server.

     c. Check the Use Client Authentication check box and click Change to configure the certificate.

        If you have selected this check box, then it indicates that you want to use secured communication between Oracle Unified Directory and ODSEE (vice versa). For secure communication, the certificate based authentication mechanism used during replication from ODSEE to Oracle Unified Directory further depends on the SASL and certificate mapper configuration.

> **Note:** Observe the following points from ODSEE configuration point of view. Make sure that the configuration has been done before proceeding with the replication gateway setup.
>
> - Ensure that the certificate is exchanged properly if there are more than one ODSEE instances.
>
> - Ensure replication agreements are enabled with the help of SSL port.
>
> - Modify certmap.conf present in the <ODSEE INST>/alise with correct details according to your certificate.
>
>   This file indicates how certificate is mapped to the LDAP entry. Also modify "cn=replication manager, cn=replication, cn=config" and add binary format of the certificate.
>
> Observe the following points from Oracle Unified Directory configuration point of view. Make sure that the following configuration is performed after the replication gateway setup is done.
>
> - Setup the Replication gateway.
>
>   After the gateway installation is done, follow the displayed post commands. Some of them are explained below.
>
> - Export the replication gateway certificate and add it to the respective ODSEE instance which needs to be replicated.
>
> - Modify DN "cn=replication manager, cn=replication, cn=config" with usercertifcate attribute which contains the ODSEE instance certificate in binary form.

  If you do not want certificate based authentication process, leave the check box unchecked and proceed with the gateway replication.

- To set up replication monitoring with registration into the ODSEE Directory Service Control Center Registry, provide the following information:

  a. Check the "Enable DSCC monitoring between ODSEE and Replication Gateway" box.

  b. **DSCC Directory Service Manager:** Enter the Directory Service Manager username.

  c. **DSCC Directory Service Manager Password:** Enter the password for the Directory Service Manager.

  d. **DSCC Registry Host Name:** Enter the host name or IP address for the DSCC Registry host.

  e. **DSCC Registry Port:** Enter the port number for the DSCC Registry host.

- Click **Next.**

The **Review Replication Setting** screen is displayed.

7. Review the ODSEE replication setup and click **Next**.

   The **Port for ODSEE Replication** screen is displayed.

8. Enter the port on the replication gateway instance that will be used for Oracle Directory Server Enterprise Edition replication updates.

9. Click **Next**.

   The **Oracle Unified Directory Server Settings** screen is displayed.

10. Enter the following information:

    - **Host Name**: Enter the directory server's host name or IP address.

      The default is the local host name.

    - **Administration Connector Port**: Enter the port that is used for administration traffic.

      The default administration port is 4444. For more information about managing administration traffic to the server, see *Oracle Fusion Middleware Administering Oracle Unified Directory*.

    - **Global Administrator User ID**: Enter the name of the global administrator that has been defined to manage replication on the Oracle Unified Directory instance.

      If no global administrator has been defined, enter the root user bind DN.

    - Enter the password of the Global Administrator.

    Click **Next**.

11. Accept the certificates.

12. If the Oracle Unified Directory server was not previously configured for replication, perform the following steps:

    - Enter the replication port number for this directory server.

    - Provide a UID and password for the new global administrator.

13. Review the replication settings and click **Next**.

    The **Replicated Base DNs** screen is displayed.

14. Select the suffixes that will be replicated between the Oracle Directory Server Enterprise Edition servers and the Oracle Unified Directory servers.

15. On the Review screen, verify the final topology and click **Finish** to complete the installation.

    The Show Summary menu item in the drop down list displays a textual summary of the resulting topology.

    The Show Topology menu item displays a graphical summary of the topology, and can be useful for obtaining a physical idea of the resulting topology.

    The Show Equivalent Command Line menu item displays all of the commands that are executed in configuring the replication gateway. This item also provides information about the next steps that are required to start replication between the two servers. For more information, about replicating between Oracle Directory Server Enterprise Edition and Oracle Unified Directory, see *Oracle Fusion Middleware Administering Oracle Unified Directory*.

16. Click **Finish** to complete the setup.

17. Execute the following command in ODSEE server host for the replication to be successful.

    ```
    dsadm export \
            -f opends-export \
            <DSEE Instance1> \
            <Base DN> \
    ```

```
{exportedLDIFPath}
```

Where {*exportedLDIFPath*} is the path of the resulting LDIF file containing the replicated data.

18. Execute the following commands in Oracle Unified Directory server for the replication to be successful.

   ■ Execute *dsreplication pre-external-initialization* command.

```
asinst/OUD/bin/dsreplication pre-external-initialization \
         --hostname <OUD hostname> \
         --port <OUD Admin port> \
         --adminUID <Provide Admin UID> \
         --adminPasswordFile <Password file> \
         --baseDN <Base DN> \
         --trustAll \
         --no-prompt \
         --noPropertiesFile
```

   ■ Execute *import-ldif* command. Copy the LDIF file generated in the first step in a directory accessible by the Oracle Unified Directory servers and run the following command for every Oracle Unified Directory server that contains data to be replicated:

```
asinst/OUD/bin/import-ldif \
         --hostname <OUD Hostname> \
         --port <OUD Admin port> \
         --bindDN <Bind DN> \
         --bindPasswordFile <Password file> \
         --includeBranch <Base DN> \
         --ldifFile {exportedLDIFPath} \
         --clearBackend \
         --trustAll \
         --noPropertiesFile
```

   ■ Execute *dsreplication post-external-initialization* command.

```
asinst/OUD/bin/dsreplication post-external-initialization \
         --hostname <OUD Hostname> \
         --port <OUD Admin Port> \
         --adminUID <Provide Admin UID> \
         --adminPasswordFile <Password file> \
         --baseDN <Base DN> \
         --trustAll \
         --no-prompt \
         --noPropertiesFile
```

5.3 Setting Up the Replication Gateway Using the Command-Line Interface (CLI)

The command-line setup is either interactive or non-interactive. The non-interactive setup enables you to configure the server without user intervention. The interactive setup prompts you for any required information before the configuration begins.

> **Note:** The command-line setup is complex and is recommended
> for scripting purposes only. Oracle recommends that you use the
> GUI to set up the replication gateway.

To set up the replication gateway using the command line:

```
$ oud-replication-gateway-setup --cli
```

In interactive command-line mode, you are prompted to provide the required
configuration details, for example:

```
$ oud-replication-gateway-setup --cli
OUD Instance location successfully created -
/local/OUD_BASE/Oracle_OUD1/../asinst_4
The migration utility ds2oud must be run to configure the OUD servers before
setting up the replication gateway.
If you have executed ds2oud type 'yes' to continue, type 'no' otherwise. (yes
/ no) [yes]: yes

Oracle Unified Directory 11.1.2.1.0
Please wait while the replication gateway setup program initializes ..... Done.

=====================================================================
Replication gateway administration settings
=====================================================================

You must provide the fully-qualified name of the host where the replication
gateway will be installed.  The ODSEE server and Oracle Unified Directory
servers in the replication topology must be able to access this host name
[server1]:

What would you like to use as the initial root user DN for the replication
gateway? [cn=Directory Manager]:
```

To facilitate scripting, you can also set up the replication gateway in non-interactive
mode, by using the `--no-prompt` option. The following example shows a typical
replication gateway setup in non-interactive mode:

```
$ oud-replication-gateway-setup --cli --hostname localhost \
  --adminConnectorPort 4444 --replicationPortForLegacy 2389 \
  --rootUserDN "cn=Directory Manager" --rootUserPasswordFile pwd-file \
  --baseDN dc=example,dc=com --hostNameLegacy ODSEE-host \
  --portLegacy 1389 --doNotUpdateTrustStoreWithLegacyCertsArg \
  --bindDNLegacy "cn=Directory Manager" --bindPasswordFileLegacy pwd-file \
  --hostNameNg OUD-host --portNg 4444 --adminUID admin \
  --adminPasswordFile pwd-file --trustAll --no-prompt \
  --noPropertiesFile --doNotMonitorUsingDsccLegacy
```

The following example shows a typical replication gateway setup in non-interactive
mode with registration into the ODSEE Directory Service Control Center Registry. This
configuration is useful when you want to monitor replicated changes using the
ODSEE monitoring interface.

```
$ oud-replication-gateway-setup --cli --hostname localhost \
  --adminConnectorPort 4444 --replicationPortForLegacy 2389 \
  --rootUserDN "cn=Directory Manager" --rootUserPasswordFile pwd-file \
  --baseDN dc=example,dc=com --hostNameLegacy ODSEE-host \
  --portLegacy 1389 --doNotUpdateTrustStoreWithLegacyCertsArg \
  --bindDNLegacy "cn=Directory Manager" --bindPasswordFileLegacy pwd-file \
```

```
--hostNameNg OUD-host --portNg 4444 --adminUID admin \
--adminPasswordFile pwd-file --trustAll --no-prompt --noPropertiesFile \
--dsccHostLegacy  gnb10492 --dsccPortLegacy 3998 --dsccAdminUidLegacy admin \
--dsccPasswordFileLegacy pwd-file
```

For more information about all of the command-line options, see the
oud-replication-gateway-setup in *Oracle Fusion Middleware Administering Oracle
Unified Directory*.

5.4 Verifying the Replication Gateway Setup

To verify that the replication gateway has been set up and is working correctly, add an
entry on the Oracle Unified Directory server. Verify that the newly added entry has
been successfully replicated to the Oracle Directory Server Enterprise Edition server.

The following example adds a user entry on the Oracle Unified Directory server:

```
$ ldapmodify -a -h oud-host -p 1389 -D "cn=directory manager" -j pwd-file
dn: uid=bjensen,ou=People,dc=example,dc=com
objectclass: top
objectclass: person
objectclass: organizationalPerson
objectclass: inetorgPerson
uid: bjensen
givenName: Barbara
sn: Jensen
cn: Babs Jensen
telephoneNumber: (408) 555-3922
facsimileTelephoneNumber: (408) 555-4000
mail: bjensen@example.com
userPassword: secret

Processing ADD request for uid=bjensen,ou=People,dc=example,dc=com
ADD operation successful for DN uid=bjensen,ou=People,dc=example,dc=com
```

The following example searches for that user entry on the Oracle Directory Server
Enterprise Edition server:

```
$ ldapsearch -h odsee-host -p 1389 -D "cn=directory manager" -j pwd-file -b
"ou=people,dc=example,dc=com" ("uid=bjensen")

version: 1
dn: uid=bjensen, ou=People, dc=example,dc=com
cn: Barbara Jensen
cn: Babs Jensen
sn: Jensen
givenName: Barbara
objectClass: top
objectClass: person
objectClass: organizationalPerson
objectClass: inetOrgPerson
ou: Product Development
ou: People
l: Cupertino
uid: bjensen
mail: bjensen@example.com
telephoneNumber: +1 408 555 1862
facsimileTelephoneNumber: +1 408 555 1992
roomNumber: 0209
userPassword: {SSHA}rDLnCHlFRhyAcBM7GZpby0MrwfxzTlIEdG7WYA==
```

6

Updating the Oracle Unified Directory Software

This chapter describes how to update an Oracle Unified Directory directory service to the latest version without a service interruption. It also describes how to update an individual directory server instance and provides considerations for Oracle Directory Services Manager (ODSM) on Oracle Weblogic Server.

The chapter includes the following sections:

- Section 6.1, "Starting Points for an Oracle Unified Directory Update"
- Section 6.2, "Considerations for Global Index Catalogs"
- Section 6.3, "Updating a Directory Service Without Service Interruption"
- Section 6.4, "Updating an Existing Oracle Unified Directory Server Instance"
- Section 6.5, "Updating ODSM on Oracle WebLogic Server"

6.1 Starting Points for an Oracle Unified Directory Update

Oracle supports the following starting points for updating Oracle Unified Directory:

- Oracle Unified Directory 11*g* Release 1 (11.1.1.5)
- Oracle Unified Directory 11*g* Release 2 (11.1.2.0)
- Oracle Unified Directory 11*g* Release 2 (11.1.2.1.0)
- Oracle Unified Directory 11*g* Release 2 (11.1.2.2.0)

6.2 Considerations for Global Index Catalogs

You cannot update 11*g* Release 1 (11.1.1.5) or 11*g* Release 2 (11.1.2.0) global index catalogs that were previously configured using the `gicadm` command. If you update Oracle Unified Directory to the current release, you must then reconfigure the global index catalogs using `gicadm`.

For information about configuring the global index catalogs, see *Oracle Fusion Middleware Administering Oracle Unified Directory*.

6.3 Updating a Directory Service Without Service Interruption

Updating a replicated Oracle Unified Directory topology involves updating the software for each server instance individually. The strategy for maintaining service during an update depends on the specifics of your deployment, but usually, you can update an entire topology without any interruption in service. Because a particular directory server instance must be stopped during the update process, maintaining

service during an update requires alternative servers that can handle client requests while a particular server is down.

If your deployment includes one or more proxy server instances that route client requests to the back-end servers, you can safely take down one directory server at a time and update that server instance. The proxy server will reroute client requests to ensure uninterrupted service. Upgrading the proxy server instance requires more than one proxy server instance with the same configuration.

If your deployment does not include a proxy server, you must configure your client applications to send requests to an alternative server while a specific directory server instance is being updated.

The following sections outline the steps to follow for each of these topologies:

- Section 6.3.1, "Upgrading a Topology That Includes a Proxy Server"

- Section 6.3.2, "Upgrading a Topology That Does Not Include a Proxy Server"

6.3.1 Upgrading a Topology That Includes a Proxy Server

This section covers these topologies:

- Section 6.3.1.1, "Upgrading a Topology with the Replication Servers and Directory Servers on the Same Host"

- Section 6.3.1.2, "Upgrading a Topology wIth Replication Servers and Directory Servers on Different Hosts"

6.3.1.1 Upgrading a Topology with the Replication Servers and Directory Servers on the Same Host

In this topology, the directory servers and replication servers are installed on the same host.

If a single host contains both a replication server and a directory server, and those servers are associated with the same ORACLE_HOME directory, the servers are stopped and updated at the same time.

In the following figure, Group 1 and Group 2 refer to configured replication groups. For more information about replication groups, see *Oracle Fusion Middleware Administering Oracle Unified Directory*.

Figure 6–1   Replicated Topology With Proxy Servers - RS and DS on the Same Host
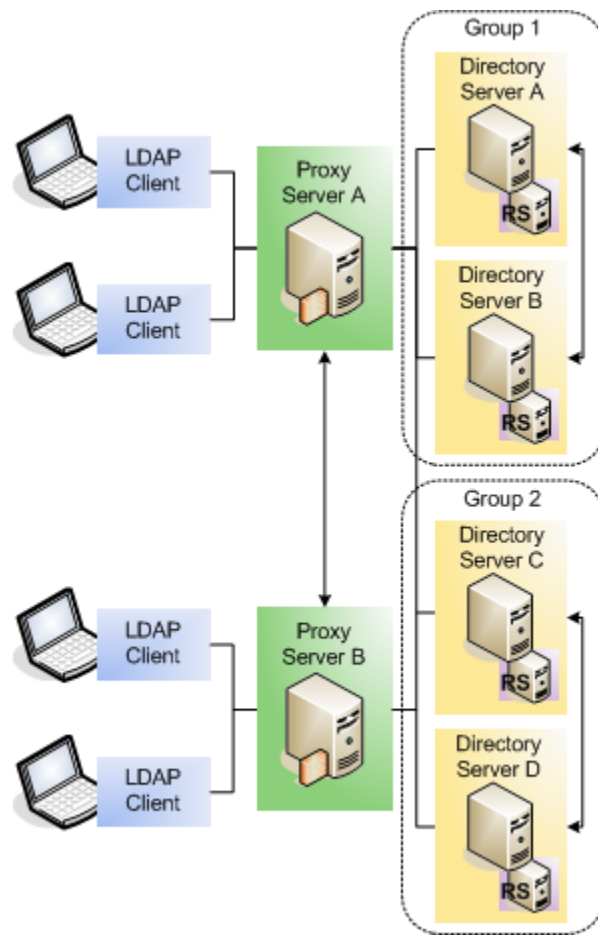
To update a topology with the directory servers and replication servers installed on the same host:

1. Change the configuration of proxy server A so that client requests are not routed to directory server A.

2. Stop directory server A. The replication server running on this host is stopped at the same time.

3. Update directory server A, following the steps in Section 6.4, "Updating an Existing Oracle Unified Directory Server Instance."

4. Restart directory server A.

5. Test that your directory service is working properly before upgrading successive servers.

6. Repeat steps 1-5 for each directory server in that replication group.

7. Follow steps 1-6 for each replication group in the topology.

8. Stop proxy server A.

9. Update proxy server A, following the steps in Section 6.4, "Updating an Existing Oracle Unified Directory Server Instance."

10. Restart proxy server A.

11. Repeat steps 8-10 for the remaining proxy servers in the topology.

6.3.1.2 Upgrading a Topology wIth Replication Servers and Directory Servers on Different Hosts

In this topology, the directory servers and replication servers are installed on different hosts. In the following figure, Group 1 and Group 2 refer to configured replication groups. For more information about replication groups, see *Oracle Fusion Middleware Administering Oracle Unified Directory*.

Figure 6–2   Replicated Topology With Proxy Servers - RS and DS on Different Hosts
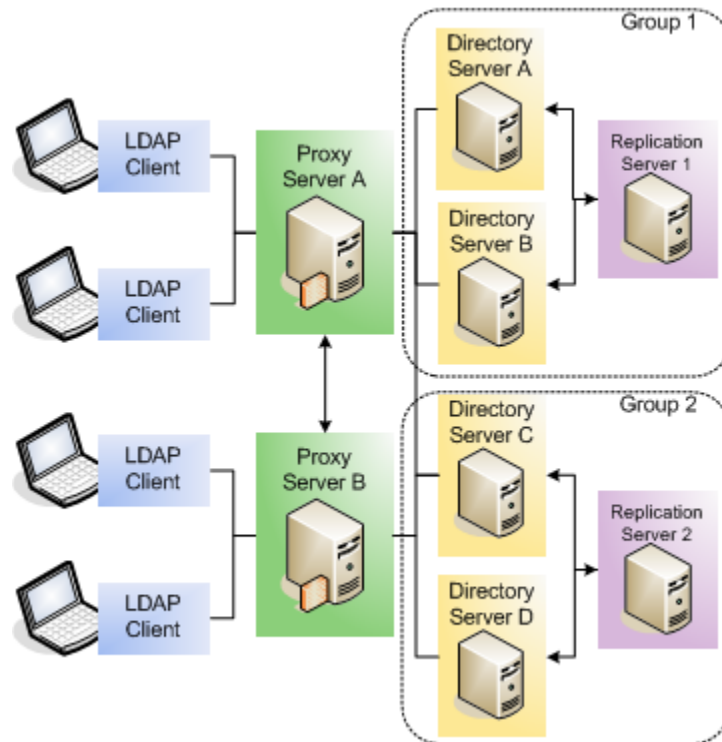
To update a topology with the directory servers and replication servers installed on different hosts:

1. Change the configuration of proxy server A so that requests are not routed to directory server A.

2. Stop directory server A.

3. Update directory server A, following the steps in Section 6.4, "Updating an Existing Oracle Unified Directory Server Instance."

4. Restart directory server A.

5. Test that your directory service is working properly before upgrading successive servers.

6. Repeat steps 1-5 for each directory server in that replication group.

7. Stop replication server 1.

The replication mechanism ensures that directory servers A and B now connect to replication server 2.

8. Update replication server 1, following the steps in Section 6.4, "Updating an Existing Oracle Unified Directory Server Instance."

9. Restart replication server 1.

10. Follow steps 1-9 for each replication group in the topology.

11. Stop proxy server A.

12. Update proxy server A, following the steps in Section 6.4, "Updating an Existing Oracle Unified Directory Server Instance."

13. Restart proxy server A.

14. Repeat steps 11-13 for the remaining proxy servers in the topology.

6.3.2 Upgrading a Topology That Does Not Include a Proxy Server

In a topology that does not include any proxy server instances, you must update your client applications so that they point to an alternative directory server each time you take a directory server down for an update.

The following diagram shows a replicated topology that does not include a proxy server. This topology assumes that the directory servers and replication servers are installed on the same `ORACLE_HOME` directory.

In this diagram, Group 1 and Group 2 refer to configured replication groups. For more information about replication groups, see *Oracle Fusion Middleware Administering Oracle Unified Directory*.

Figure 6–3   Replicated Oracle Unified DirectoryTopology Without Proxy Servers
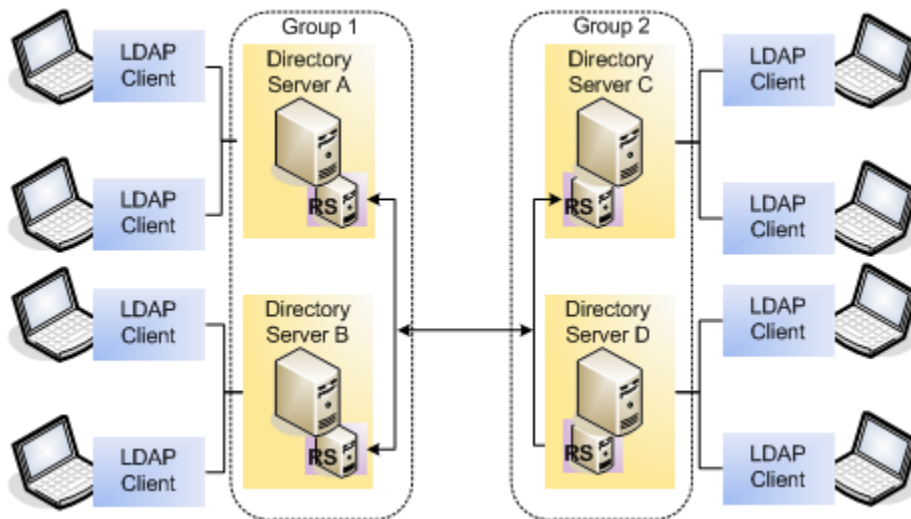
To update a topology that does not include a proxy server:

1. Change your client application configuration so that applications do not access directory server A directly.

2. Stop directory server A. The replication server on this host is stopped and updated at the same time.

3. Update directory server A, following the steps in Section 6.4, "Updating an Existing Oracle Unified Directory Server Instance."

4. Restart directory server A.

5. Test that your directory service is working properly before upgrading successive servers.

6. Change your client application configuration so that applications do not access directory server B directly.

7. Stop directory server B.

8. Update directory server B, following the steps in Section 6.4, "Updating an Existing Oracle Unified Directory Server Instance."

9. Follow steps 1-8 for each replication group in the topology.

6.4 Updating an Existing Oracle Unified Directory Server Instance

You can update all Oracle Unified Directory server instances that are associated with a specific `ORACLE_HOME` directory by installing the updated software version over the existing `ORACLE_HOME`.

To update an existing Oracle Unified Directory server instance:

1. Download the latest Oracle Unified Directory version from the Oracle Software Delivery Cloud.

For more information, see Section 2.1, "Obtaining the Software to Install Oracle Unified Directory."

2. Stop any Oracle Unified Directory server instances that are associated with the `ORACLE_HOME` directory that you are upgrading.

On UNIX and Linux systems:

```
$ instance-dir/OUD/bin/stop-ds
```

On Windows systems:

```
instance-dir\OUD\bat\stop-ds.bat
```

Servers in the topology that are associated with a different `ORACLE_HOME` will not be updated and do not need to be stopped.

3. Follow the steps outlined in Section 2.2, "Installing Oracle Unified Directory."

Where you are required to specify an installation location, enter the same OUD Base Location Home and Oracle Home Directory (`ORACLE_HOME`) that you specified for the original installation.

For more information about these directories, see Section 1.4, "Understanding the Oracle Unified Directory Installation Directories."

The installer recognizes an existing installation and updates the relevant binary files. Do not recreate the server instances.

4. On Windows systems, manually copy the `start-ds.bat` file (located at `INSTALL_DIR\bat\start-ds.bat`) and replace the `start-ds.bat` file of the instances that need to be updated.

5. Update any Oracle Unified Directory server instances that are associated with the `ORACLE_HOME` directory:

> **Note:** It is mandatory to apply Oracle Unified Directory Bundle Patch 11.1.2.3.1 that is part of Oracle Identity Management Suite Bundle Patch 11.1.2.3.2 (see My Oracle Support for Doc IDs **2067482.1** and **1494151.1**) before running the `start-ds --upgrade` command to update the Oracle Unified Directory software from any prior release to 11g Release R2 PS3 (11.1.2.3). Failing to do so might result in an undetermined state.

On UNIX and Linux systems:

```
$ instance-dir/OUD/bin/start-ds --upgrade
```

On Windows systems:

```
instance-dir\OUD\bat\start-ds.bat --upgrade
```

> **Caution:** If the server instance has large static groups or a large number of total members in all static groups, updating the instance to 11g Release 2 (11.1.2.3) can take some time. Therefore, avoid ending the update (such as using `Ctrl-C` to end the process) before it is finished. Ending the update early can leave the server instance in a undetermined state.

The output of the `start-ds --upgrade` command is logged in the *INSTANCE_PATH/logs/server.out* directory.

6. Restart the server instances that you stopped in Step 1.

On UNIX and Linux systems:

```
$ instance-dir/OUD/bin/start-ds
```

On Windows systems:

```
instance-dir\OUD\bat\start-ds.bat
```

6.5 Updating ODSM on Oracle WebLogic Server

If you are running ODSM on Oracle WebLogic Server to manage Oracle Unified Directory, consider the following sections:

- ODSM Version Requirements

- Upgrading Oracle WebLogic Server

- Upgrading the Oracle Application Development Framework (Oracle ADF)

6.5.1 ODSM Version Requirements

The version of ODSM described in this guide is 11*g* Release 2 (11.1.2.3). When you update the Oracle Unified Directory software to 11*g* Release 2 (11.1.2.3), ODSM is also updated to this same release.

Several requirements for using ODSM with Oracle Unified Directory include:

- You can use ODSM 11*g* Release 2 (11.1.2.3) to manage only Oracle Unified Directory 11g Release 2 (11.1.2.3.)

- You cannot use ODSM version 11.1.2.3 to manage previous versions of Oracle Unified Directory, Oracle Internet Directory, or Oracle Virtual Directory. Conversely, you cannot use versions of ODSM shipped with Oracle Internet Directory or Oracle Virtual Directory to manage any versions of Oracle Unified Directory.

> **Note:** After you update Oracle Unified Directory, you might encounter problems on Oracle WebLogic Server when you try to access the updated version of ODSM. This problem usually occurs if you used your browser to access an earlier version of ODSM. During an update operation, the ODSM URL can change.
>
> Therefore, to access the updated version of ODSM, first clear your browser's cache and cookies.

6.5.1.1 Updating Multiple Instances of ODSM

If you have multiple instances of ODSM in your replication topology, consider the following requirements:

- If you update one ODSM instance to 11*g* Release 2 (11.1.2.3), you must update all ODSM and replicated instances.

- If you update ODSM to 11*g* Release 2 (11.1.2.3), Oracle Unified Directory must be the same version. An updated ODSM version is not supported with earlier versions of Oracle Unified Directory.

6.5.2 Upgrading Oracle WebLogic Server

ODSM 11*g* Release 2 (11.1.2.3) is compatible with Oracle WebLogic Server 11*g* Release 1 (10.3.6).

To upgrade Oracle WebLogic Server from an earlier version such as 10.3.5 to 10.3.6, follow the procedure in the *Oracle Fusion Middleware Upgrading Oracle WebLogic Server*.

If you need to install WebLogic Server, see Section 2.3.1, "Installing Oracle WebLogic Server."

6.5.3 Upgrading the Oracle Application Development Framework (Oracle ADF)

ODSM 11*g* Release 2 (11.1.2.3) is compatible with Oracle Application Development Framework 11*g* Release 1 (11.1.1.9).

To upgrade Oracle ADF from version 11.1.1.5 or 11.1.1.6 to version 11.1.1.9, follow the procedure in the *Oracle Fusion Middleware Patching Guide*.

7

Configuring the JVM, Java, and Database Cache Options for Oracle Unified Directory

This chapter describes the configuration and manual tuning options for the Java Virtual Machine (JVM), Java, and database cache for the Oracle Unified Directory server and command-line utilities.

This chapter includes the following sections:

- Section 7.1, "Configuring the JVM Using the `dstune` Utility"
- Section 7.2, "Configuring the Default JVM and Java Arguments"
- Section 7.3, "Configuring the Java Run-Time Settings During the Server Setup"
- Section 7.4, "Setting the Database Cache Size"
- Section 7.5, "Setting the Database Cache Mode"

Note: Beginning with 11*g* Release 2 (11.1.2.3), Oracle Unified Directory requires JDK 7 or JRE 7.

7.1 Configuring the JVM Using the `dstune` Utility

The `dstune` command-line utility allows you to tune the Oracle Unified Directory server and tools (`import-ldif`, `export-ldif`, `rebuild-index`, and `verify-index`) using criteria such as the data that the directory contains or the amount of system memory to use. The `dstune` utility provides these options:

- The `data-based` subcommand tunes the server based on the data that the database either already contains or will contain.
- The `mem-based` subcommand tunes the server and tools based on the heap size they will use.
- The `set-runtime-options` subcommand allows you either to use the JVM default values on the system or to directly provide JVM arguments to tune the server and tools.

Note: The `dstune memory-based` and `data-based` options are available only if you are running a JVM that uses Java HotSpot, such as Java Platform, Standard Edition (Java SE).

For more information, including the `dstune` syntax and tuning examples, see *Oracle Fusion Middleware Administering Oracle Unified Directory*.

7.2 Configuring the Default JVM and Java Arguments

This section describes how to configure the JVM and the Java options for Oracle Unified Directory server and each command-line utility, including:

- Section 7.2.1, "Using the Java Properties File"

- Section 7.2.2, "Configuring JVM Options"

- Section 7.2.3, "Specifying the Java Virtual Machine for a Specific Utility"

- Section 7.2.4, "Specifying the Java Arguments for a Specific Utility"

7.2.1 Using the Java Properties File

The `java.properties` file contains the Java configuration properties that are used by Oracle Unified Directory scripts and server commands. This file is located in *instance-dir*/OUD/config/ on UNIX and Linux systems or *instance-dir*\OUD\config\ on Windows systems.

The properties in the `java.properties` file have these formats:

- *command-name*.java-home=*JVM-path*

- *command-name*.java-args=*JVM-arguments*

To use the configuration properties in the `java.properties` file:

1. Edit the properties in the file you want to set.

   For example, you can set the Java properties to specify whether a command runs using the JVM in `-server` mode or `-client` mode.

   Or, for certain commands, including `import-ldif`, `export-ldif`, `backup`, and `restore`, you can specify the Java arguments and a different JVM, if you prefer, depending on whether the command is run in online or offline mode.

2. Run the `dsjavaproperties` (or `dsjavaproperties.bat`) command, which uses the properties in the `java.properties` to update the Oracle Unified Directory scripts and commands, so that they use the specific JVM and JVM arguments specified in `java.properties`.

For examples, see Section 7.2.3, "Specifying the Java Virtual Machine for a Specific Utility" and Section 7.2.4, "Specifying the Java Arguments for a Specific Utility."

For more information, about `dsjavaproperties`, see *Oracle Fusion Middleware Administering Oracle Unified Directory*.

Table 7–1 shows the properties in the `java.properties` file that are relevant to Oracle Unified Directory.

Table 7–1   Properties in the `java.properties` File Relevant to Oracle Unified Directory

Property	Description
overwrite-env-java-args	If `true`, the system checks the `default.java-args` property in this properties file before checking the `OPENDS_JAVA_ARGS` environment variable.
	If `false`, the system checks the `OPENDS_JAVA_ARGS` environment variable first.
default.java-home	Sets the JVM that will be used for the directory server and all of its command-line utilities, unless a different JVM is specified for a particular utility.

7.2.2 Configuring JVM Options

Table 7–2 summarizes the Java options that can impact the server's performance. Some of these options apply only to the Oracle JVM.

Table 7–2   Java Options That Can Affect Oracle Unified Directory Server Performance

Condition	Option	Description
	-server	Selects the server application run-time optimizations. The directory server will take longer to start, but it will be better optimized to produce higher throughput.
	-d64	For 64-bit machines only. By default, the directory server selects a 32-bit JVM regardless of the architecture. Specify this option when a JVM greater than 4 Gbytes heap is required and the architecture is 64-bit.
	-Xms2G -Xmx2G	Selects the initial and maximum memory sizes available to the JVM, respectively. These values are used for the JVM heap, which reserves memory for the directory server and its database (DB) cache (or caches if more than one).
		Increasing the amount of memory available can improve performance, but increasing it to too high a value can have a detrimental effect in the form of longer pauses for full garbage collection runs. Therefore, the initial and maximum sizes should be set to the same value.
		As a general guideline, examine the size of the Oracle Berkeley Java Edition (JE) database folders (instance-dir/OUD/db/userRoot). Based on the folders' combined size, determine how much memory you want to reserve for the database cache. After determining this value, tune the local DB back-end properties, db-cache-percent or db-cache-size and other JVM options appropriately.
		Be careful to allow additional memory for the server run time. For example, if you have a single database of 1 Gbyte, which you want to store entirely in memory, then a 2 Gbyte heap with 60% reserved for the database cache should be sufficient for efficient directory server performance.
		You can test this setup by preloading the database with the local database back end by using the preload-time-limit property.
		JVM heaps greater than 4 Gbytes require a 64-bit JVM.
	DisableExplicitGC	Prevents external applications from forcing expensive garbage collections. If you are using jstatd or other RMI-based applications to monitor Oracle Unified Directory, consider using this option to avoid unexpected pauses.
	-XX:NewSize=512M	In heavy throughput environments, you should consider using this option to increase the size of the JVM young generation.
		By default, the young generation is quite small, and high throughput scenarios can result in a large amount of generated garbage. This garbage collection, in turn, causes the JVM to inadvertently promote short-lived objects into the old generation.

Table 7–2 (Cont.) Java Options That Can Affect Oracle Unified Directory Server Performance

Condition	Option	Description
Server Only	`-XX:+UseConcMarkSweepGC`	Selects the CMS garbage collector. This garbage collector is set for *low pause time*. It will result in a Java application that has a lower average throughput, but much shorter CPU-intensive garbage collections. This option is required in environments that have response time constraints.
	`-XX:CMSInitiatingOccupancyFr action=70`	Selects the level at which the collection is started. The default value is 68%.
Offline Import Only	`-XX:+UseParallelOldGC`	Selects the parallel old generational garbage collector. This garbage collector is set for *high throughput*. It will maximize the average throughput of the `import-ldif` utility at the cost of an occasional stop-the-world garbage collection, which is not as critical to imports.
	`-XX:+PrintGCDetails`	Prints the garbage collection details.
	`-XX:+PrintGCTimeStamps`	Prints the garbage collection time stamps to help with debugging.
Other Applications (for example, `dsconfig`)	`-client`	Selects client application run-time optimizations. The application will be faster to start and more responsive due to lower compilation overheads.
	`-Xms8m`	Selects a low initial JVM heap size for an application.

7.2.3 Specifying the Java Virtual Machine for a Specific Utility

To set the JVM for a specific utility:

1. Edit the following property in the `java.properties` file.

   command-name.java-home=*jvm-location*

   For example, to configure a specific JDK 1.7 for the offline `import-ldif` command, set the property that starts with `import-ldif.offline`. For example:

   `import-ldif.offline.java-home=/usr/java/jdk1.7.0`

2. Run the `dsjavaproperties` utility to apply the property value.

7.2.4 Specifying the Java Arguments for a Specific Utility

To set the Java arguments for a specific utility:

1. Edit the following property in the `java.properties` file.

   command-name.java-args=*arguments*

   For example, to specify that a maximum heap size of 256 Mbytes be used for the online export, set the property that starts with `export-ldif.online`. For example:

   `export-ldif.online.java-args=-Xms256m -Xmx256m`

2. Run the `dsjavaproperties` utility to apply the property value.

7.3 Configuring the Java Run-Time Settings During the Server Setup

You can provide run-time options when you run the directory server setup script (`oud-setup` or `oud-setup.bat`), as follows:

- In GUI mode, on the **Providing Runtime Options** screen, click **Change** to change any of the displayed values for the **Server Runtime Settings** or the **Offline Tools Runtime Settings**.

  See Section 3.1, "Setting Up the Directory Server Using the Graphical User Interface (GUI)."

- In CLI mode, you can specify JVM arguments when you tune Oracle Unified Directory server and the off-line tools.

  See Section 3.2, "Setting Up the Directory Server Using the Command-Line Interface (CLI)."

7.4 Setting the Database Cache Size

The size of the database cache can affect the overall performance of Oracle Unified Directory server. You must determine your specific memory settings for the database cache depending on your hardware, the number and size of entries in your directory, and the performance requirements for your deployment.

For example, when importing data using the `import-ldif` utility, you can configure the directory server to avoid (or minimize) potential database cache eviction problems. Ideally, you should set the database cache to a value that allows the entire database to fit into the cache.

The size of the required heap depends on the number of entries and their size. For example, if you are importing 200,000 entries of 10 Kbytes each, you might specify two Gbytes for the JVM heap size, and then allocate at least one Gbyte for the directory server run-time environment and the rest for the database cache.

You can set the database cache by configuring the `db-cache-percent` or the `db-cache-size` properties using either the `dsconfig` command-line utility or Oracle Directory Sever Manager (ODSM).

The `db-cache-percent` and the `db-cache-size` properties represent the maximum size that the server can use for the database cache. If the database is smaller than the size set by either of these properties, only the size of the database is allocated to the JVM heap.

> **Note:** The `db-cache-size` property has precedence over the `db-cache-percent` property, if both properties have values. Therefore, to set the `db-cache-percent` property, the `db-cache-size` property must be set to 0 Mbytes (the default).

To set the database cache using `dsconfig`:

1. Change to the directory where `dsconfig` is located.

   On UNIX and Linux systems:

   ```
   $ cd instance-dir/OUD/bin
   ```

   On Windows systems:

   ```
   C:\> cd instance-dir\OUD\bat
   ```

2. Run the `dsconfig` command to set the `db-cache-percent` property. For example:

   ```
   $ dsconfig set-workflow-element-prop \
   --element-name userRoot --set db-cache-percent:50 \
   ```

```
--hostname hostname --port port-number \
-X -D "cn=Directory Manager" -j /tmp/password -n
```

This example sets the `db-cache-percent` to 50 percent. Thus, for a 2 Gbyte memory allocation, 1 Gbyte of memory will be allocated to the database cache and the rest to the JVM.

7.5 Setting the Database Cache Mode

The database cache mode (`db-cache-mode` property) controls the caching of records in the database cache. The database cache is used to store Java Edition (JE) nodes (upper, inner and leaf nodes). When a record is stored or retrieved, the database cache mode determines how long the record is subsequently retained in the cache, relative to other records in the cache.

The default database cache mode retains all types of nodes in the cache. The default mode is recommended for most deployments. However, you might consider changing the mode if your performance expectations are not being met or if the memory available to run Oracle Unified Directory cannot hold all entries in the database cache.

Other database cache modes to consider are:

- `evict-ln` mode evicts leaf nodes from the database cache once they are used. Use this mode only if the default mode does not meet your performance expectations and the memory allocated to Oracle Unified Directory is lower than your database size. Using this mode reduces the memory pressure for Java garbage collection and the elapsed processing time (`etime`) for outliers.

- `evict-bin` mode evicts bottom inner nodes from the database cache once they are used. Before using this mode, Oracle recommends trying the `evict-ln` mode. Use this mode in staging deployments only if the memory allocated to Oracle Unified Directory is significantly smaller than the database size and you cannot otherwise meet your performance expectations.

For other values that you can specify for the database cache mode, see the "DB Local Backend Workflow Element" in the *Oracle Fusion Middleware Configuration Reference for Oracle Unified Directory*.

To set the database cache mode, use the `dsconfig` command-line utility. For example to set the mode to `evict-ln`:

```
$ dsconfig set-workflow-element-prop \
  --element-name userRoot \
  --set db-cache-mode:evict-ln \
  --hostname localhost --port 4444 \
  -X -D "cn=Directory Manager" -j password-file -n
```

See also *Oracle Fusion Middleware Administering Oracle Unified Directory*.

8

Managing Oracle Unified Directory as a Windows Service

This chapter describes how to manage Oracle Unified Directory as a Microsoft Windows service.

This chapter includes the following sections:

- Section 8.1, "Managing the Oracle Unified Directory Server as a Windows Service"
- Section 8.2, "Removing the Oracle Unified Directory Windows Service"

8.1 Managing the Oracle Unified Directory Server as a Windows Service

Use the `windows-service` command to enable or disable the Oracle Unified Directory server as a Windows service.

To enable the server as a Windows service, use the following command:

```
C:\> instance-dir\OUD\bat\windows-service.bat -e
```

To disable the server as a Windows service, use the following command:

```
C:\> instance-dir\OUD\bat\windows-service.bat -d
```

For more information about the `windows-service` command, see *Oracle Fusion Middleware Administering Oracle Unified Directory*.

> **Note:** You can also specify that the Oracle Unified Directory server should run as a Windows service, if you use the GUI installation. On the installation Review panel, select Run the server as a Windows Service.

8.1.1 Configuring the Timeout Value When the Oracle Unified Directory Server Starts

If the system is heavily loaded when it boots, the process that starts the server might time out while waiting for the server to start. By default, the server attempts to start 100 times, with an interval of 5 seconds between attempts.

You can configure the number of attempts that the server makes to start by setting the value of the `OUD_WINDOWS_SERVICE_START_NTRIES` system environment variable.

8.2 Removing the Oracle Unified Directory Windows Service

The uninstall process should cleanly uninstall and remove Oracle Unified Directory from your system. However, for Windows platforms, there might be times when the uninstall fails to remove files due to an active Windows service.

You can remove the remaining Windows service in two ways:

- Section 8.2.1, "Removing a Windows Service Using `windows-service.bat`"
- Section 8.2.2, "Removing the Oracle Unified Directory Service From the Windows Registry"

8.2.1 Removing a Windows Service Using `windows-service.bat`

You can use the `windows-service.bat` command to clean up any existing Windows services. This command is located in `instance-dir\OUD\bat`.

1. Use the `windows-service.bat` command with the `--cleanupService` option.

   Type the `serviceName` that you want to remove.

   ```
   C:\> instance-dir\OUD\bat\windows-service.bat --cleanupService serviceName
   ```

2. Restart Windows to complete the cleanup.

   > **Note:** This command removes Oracle Unified Directory services only. The command will not clean up another product's services.

8.2.2 Removing the Oracle Unified Directory Service From the Windows Registry

You can manually remove any remaining Windows service entries from the Windows registry.

> **Caution:** Make sure that you know what you are doing when removing entries in your Windows registry. You can permanently damage your operating system.

1. Run the Task Manager, click the Processes tab, and ensure that `opends_service.exe` is not running.

   If it is, select the process and click the End Process button at the bottom right of the Task Manager dialog.

2. Run `regedit` and go down the registry tree following this path.

   ```
   My Computer->HKEY_LOCAL_MACHINE->SYSTEM->CurrentControlSet->Services->Oracle
   Unified Directory
   ```

   If you installed more than one instance of Oracle Unified Directory, the added services are named `Oracle Unified Directory-2`, `Oracle Unified Directory-3`, and so on.

   Check that the service that you about to remove points to the correct instance.

3. Delete the entry from the Registry.

4. Search the registry for `LEGACY_OUD` control sets that might be saved in other control sets.

Search the following:

```
HKEY_LOCAL_MACHINE->SYSTEM->ControlSetxyz->Enum->Root->LEGACY_ORACLE_UNIFIED_DI
RECTORY-w
```

where `w` is the number of Oracle Unified Directory instances that you have registered as a service and `xyz` is the number of configuration profiles saved on the machine. This entry is typically found in `ControlSet001`, but it can be located elsewhere.

Depending on your profile, your system configuration, and the control set you are trying to edit, the registry entries might be protected from deletion. In this case, you might need Administrator privileges to perform this operation, or the system control set might be refreshed the next time Windows starts successfully, thus confirming that the current configuration is valid.

5. Delete the instance directory to ensure that you have completely uninstalled Oracle Unified Directory.

6. Restart Windows.

The Windows service should be removed.

9

Deinstalling Oracle Unified Directory

This chapter describes how to deinstall Oracle Unified Directory server instances you have configured and then how to completely remove the software from your system.

To completely remove the Oracle Unified Directory software from your system, you must follow the procedures in the following sections in order:

- Section 9.1, "Deinstalling an Oracle Unified Directory Instance"
- Section 9.2, "Removing the Oracle Unified Directory Software"

9.1 Deinstalling an Oracle Unified Directory Instance

The following procedures describe how to deinstall the server instance for a directory server, a proxy server, and a replication gateway server.

You can remove a server instance using one of the following modes:

- Graphical user interface (GUI) mode.
- Interactive command-line mode.
- Using a Script.

For more information about the uninstall command, see *Oracle Fusion Middleware Administering Oracle Unified Directory*.

9.1.1 Deinstalling a Directory Server Instance

You can deinstall a directory server instance as follows:

- Section 9.1.1.1, "Deinstalling a Directory Server Instance Using GUI Mode"
- Section 9.1.1.2, "Deinstalling a Directory Server Instance Using the CLI"

9.1.1.1 Deinstalling a Directory Server Instance Using GUI Mode

GUI mode is the default and recommended deinstall option. The GUI provides an easy interface for removing a directory server instance.

1. Launch the graphical deinstaller, as follows:

   On UNIX and Linux systems:

   ```
   $ instance-dir/OUD/uninstall
   ```

   On Windows systems:

   ```
   C:\> instance-dir\OUD\uninstall.bat
   ```

2. Deselect any components that you do not want to remove and click **Uninstall**.

By default, all components are selected for removal.

3. If the server is part of a replication topology, click **Yes** to continue the deinstallation.

The uninstaller starts the server (if it is not already running) and asks you for your Global Administrator login to remove the references to this server in the other replicating directory servers.

4. If the server is a standalone server and is running, a dialog box is displayed, asking to shut down the server before continuing with the deinstall.

Click **Yes** to have the uninstaller stop the server for you and continue with the uninstallation.

5. Review the logs to confirm the file or directory removals. UNIX and Linux logs the entries at `/var/tmp`, Linux at `/tmp`, and Windows in the location defined by the `TEMP` user environment variable.

Log files are listed as `oud-uninstall-IDNumber.log`, where *IDNumber* is a system-generated number for your log.

6. For Windows systems, check the Windows registry for any remaining keys ending with `Oracle Unified Directory`. For example:

```
SYSTEM\\CurrentControlSet\\Services\\EventLog\\Application\\Oracle Unified
Directory
```

9.1.1.2 Deinstalling a Directory Server Instance Using the CLI

You can remove an Oracle Unified Directory instance in interactive, command-line mode by typing `uninstall --cli`. In interactive mode, you are prompted for any required input.

1. Launch the CLI uninstaller, as follows:

On UNIX and Linux systems:

```
$ instance-dir/OUD/uninstall --cli
```

On Windows systems:

```
C:\> instance-dir\OUD\uninstall.bat --cli
```

2. Select the components to be removed.

   a. To remove all components, press Enter or Return to accept the default.

   b. To remove specific components and retain others, type `2`.

   When `uninstall` prompts you to select the components to be deleted, press Enter or Return to accept the defaults.

3. If the server is part of a replication topology, type `Yes` or press Enter or Return to continue the uninstallation.

The uninstaller starts the server (if it is not already running) and requests your Global Administrator login to remove the references to this server in the other replicating directory servers.

4. If your directory server is a standalone server and is running, the uninstall prompts you to stop the server and remove all files.

Press Enter or Return to accept the default (`Yes`).

5. To quit the uninstaller without removing files, type q.

   The uninstall quits the process and logs the entry.

   UNIX and Linux logs the entry at /var/tmp, Linux at /tmp, and Windows at the location defined by the TEMP user environment variable.

6. Check that all files and directories have been removed. If they have not been removed, manually remove them.

7. For Windows systems, check the Windows registry for any remaining keys ending with Oracle Unified Directory.

   For example:

   ```
   SYSTEM\\CurrentControlSet\\Services\\EventLog\\Application\\Oracle Unified
   Directory
   ```

9.1.1.3 Deinstalling a Directory Server Instance Using a Script

The uninstall command provides two options, --quiet and --no-prompt, for simple scripting. Most directory administrators have their preferred scripting language for automating their system tasks. The directory server provides script-friendly options with its command-line utilities to facilitate quick coding.

1. Create an uninstallation script and add the following uninstall command.

   Make sure to type the command on a single line.

   ```
   instance-dir/OUD/uninstall --cli \
   --remove-all --no-prompt --forceOnError --quiet
   ```

2. Run the script.

3. Check for remaining directories in the logs, and if any directories or files remain, manually delete them.

9.1.2 Deinstalling a Proxy Server Instance

You can uninstall a proxy server instance as follows.

- Section 9.1.2.1, "Deinstalling a Proxy Server Instance Using the GUI"
- Section 9.1.2.2, "Deinstalling a Proxy Server Instance Using the CLI"

9.1.2.1 Deinstalling a Proxy Server Instance Using the GUI

GUI mode is the default and recommended deinstall option. The GUI provides an easy interface for removing a proxy server instance.

1. Launch the graphical uninstaller, as follows:

   On UNIX and Linux systems:

   ```
   $ instance-dir/OUD/uninstall
   ```

   On Windows systems:

   ```
   C:\> instance-dir\OUD\uninstall.bat
   ```

2. Deselect any components that you do not want to remove and click Uninstall.

   By default, all components are selected for removal.

3. If the server is running, a dialog box is displayed, asking to shut down the server before continuing with the uninstall.

Click `Yes` to have the uninstaller stop the server for you and continue with the uninstallation.

4. Review the logs to confirm the file or directory removals. UNIX and Linux logs the entries at `/var/tmp`, Linux at `/tmp`, and Windows in the location defined by the `TEMP` user environment variable.

   Log files are listed as `oud-uninstall-IDNumber.log`, where *IDNumber* is a system-generated number for your log.

5. For Windows systems, check the Windows registry for any remaining keys ending with `Oracle Unified Directory`. For example:

   ```
   SYSTEM\\CurrentControlSet\\Services\\EventLog\\Application\\Oracle Unified
   Directory
   ```

9.1.2.2 Deinstalling a Proxy Server Instance Using the CLI

You can remove a proxy instance in interactive, command-line mode by typing `uninstall --cli`. In interactive mode, you are prompted for any required input.

1. Launch the CLI uninstaller, as follows:

   On UNIX and Linux systems:

   ```
   $ instance-dir/OUD/uninstall --cli
   ```

   On Windows systems:

   ```
   C:\> instance-dir\OUD\uninstall.bat --cli
   ```

2. Select the components to be removed.

   a. To remove all components, press Enter or Return to accept the default.

   b. To remove specific components and retain others, type `2`.

      When `uninstall` prompts you to select the components to be deleted, press Enter or Return to accept the defaults.

3. If your proxy server is running, the uninstall prompts you to stop the server and remove all files.

   Press Enter or Return to accept the default (`Yes`).

4. To quit the uninstaller without removing files, type `q`.

   The uninstall quits the process and logs the entry.

   UNIX and Linux logs the entry at `/var/tmp`, Linux at `/tmp`, and Windows at the location defined by the `TEMP` user environment variable.

5. Check that all files and directories have been removed. If they have not been removed, manually remove them.

6. For Windows systems, check the Windows registry for any remaining keys ending with `Oracle Unified Directory`.

   For example:

   ```
   SYSTEM\\CurrentControlSet\\Services\\EventLog\\Application\\Oracle Unified
   Directory
   ```

9.1.2.3 Deinstalling a Proxy Server Instance Using a Script

The `uninstall` command provides two options, `--quiet` and `--no-prompt`, for simple scripting. Most directory administrators have their preferred scripting language for

automating their system tasks. Oracle Unified Directory provides script-friendly options with its command-line utilities to facilitate quick coding.

1. Create an uninstallation script and add the following `uninstall` command.

   Make sure to type the command on a single line.

   ```
   instance-dir/OUD/uninstall --cli \
   --remove-all --no-prompt --forceOnError --quiet
   ```

2. Run the script.

3. Check for remaining directories in the logs, and if any directories or files remain, manually delete them.

9.1.3 Deinstalling a Replication Gateway Instance

You can deinstall a replication gateway server instance by using the graphical user interface, or the command line. This section covers the following topics:

-
-
-

Note: Should the replication gateway uninstallation fail, for any reason, references to the gateway might remain in the ODSEE server configuration. In this case, remove the following from the ODSEE server configuration manually:

- The replication manager entry that is created automatically when the gateway is installed.
- The replication agreement(s) to the gateway.

9.1.3.1 Deinstalling a Replication Gateway Instance Using the GUI

GUI mode is the default and recommended deinstall option. The GUI provides an easy interface for removing a replication gateway instance.

1. Launch the graphical uninstaller, as follows:

   On UNIX and Linux systems:

   ```
   $ instance-dir/OUD/uninstall
   ```

   On Windows systems:

   ```
   C:\> instance-dir\OUD\uninstall.bat
   ```

2. On the Oracle Unified Directory Server Settings screen, enter the following information:

   - The host name on which the replication gateway server instance is installed.
   - The UID of the Global Administrator used to connect to the Oracle Unified Directory servers.
   - The password of the Global Administrator.

   Click **Next**.

3. On the ODSEE Server settings screen, enter the following information:

- The bind DN and password of the user configured to connect to the ODSEE server.

- The DSCC Directory Server Manager Password

Click **Next**.

4. On the Confirm Replication Gateway Uninstall screen, click **Finish**.

5. Review the logs to confirm the file or directory removals. UNIX and Linux logs the entries at /var/tmp, Linux at /tmp, and Windows in the location defined by the TEMP user environment variable.

   Log files are listed as oud-uninstall-IDNumber.log, where *IDNumber* is a system-generated number for your log.

6. For Windows systems, check the Windows registry for any remaining keys ending with Oracle Unified Directory. For example:

   ```
   SYSTEM\\CurrentControlSet\\Services\\EventLog\\Application\\Oracle Unified
   Directory
   ```

9.1.3.2 Deinstalling a Replication Gateway Instance Using the CLI

You can remove a replication gateway instance in interactive, command-line mode by typing uninstall --cli. In interactive mode, you are prompted for any required input.

Before you start the deinstall, you must have the bind credentials for:

- the Global Administrator used to connect to the OUD server instances

- the administrative user who connects to the ODSEE server instance

The following example provides these credentials at the command-line.

1. Launch the CLI uninstaller, as follows:

   On UNIX and Linux systems:

   ```
   $ instance-dir/OUD/uninstall --cli -h server1.example.com \
     --adminUID admin --adminPasswordFile pwd-filename \
     --bindDNLegacy "cn=Directory Manager" --bindPasswordFileLegacy pwd-filename \
     --dsccPasswordFileLegacy pwd-file
   ```

   On Windows systems:

   ```
   C:\> instance-dir\OUD\uninstall.bat --cli -h server1.example.com \
     --adminUID admin --adminPasswordFile pwd-filename \
     --bindDNLegacy "cn=Directory Manager" --bindPasswordFileLegacy pwd-filename \
     --dsccPasswordFileLegacy pwd-file
   ```

2. Type 1 to uninstall the gateway.

3. For Windows systems, check the Windows registry for any remaining keys ending with Oracle Unified Directory.

   For example:

   ```
   SYSTEM\\CurrentControlSet\\Services\\EventLog\\Application\\Oracle Unified
   Directory
   ```

9.1.3.3 Deinstalling a Replication Gateway Instance Using a Script

The uninstall command provides two options, --quiet and --no-prompt, for simple scripting. Most directory administrators have their preferred scripting language for

automating their system tasks. Oracle Unified Directory provides script-friendly options with its command-line utilities to facilitate quick coding.

1. Create an deinstallation script and add the following `uninstall` command.

    You must type the command on a single line.

    ```
    instance-dir/OUD/uninstall --cli -h hostname \
    --adminUID admin --adminPasswordFile pwd-filename \
    --bindDNLegacy bindDN --bindPasswordFileLegacy pwd-filename \
    --dsccPasswordFileLegacy pwd-filename --remove-all --no-prompt \
    --forceOnError --quiet
    ```

2. Run the script.

3. Check for remaining directories in the logs, and if any directories or files remain, manually delete them.

9.2 Removing the Oracle Unified Directory Software

To remove the Oracle Unified Directory software from your system, run the uninstaller, as follows:

1. Change to the `$ORACLE_HOME/oui/bin` directory.

    On UNIX or Linux systems:

    ```
    $ cd $ORACLE_HOME/oui/bin
    ```

    On Windows systems, change to:

    ```
    $ORACLE_HOME\oui\bin
    ```

2. Run the Oracle Universal Installer with the `-deinstall` option.

    On UNIX or Linux systems:

    ```
    $ ./runInstaller -deinstall
    ```

    On Windows systems:

    ```
    $ ./setup.exe -deinstall
    ```

3. On the Welcome screen, click **Next**.

4. On the Deinstall Oracle Home screen, verify the location of what is being uninstalled and click **Deinstall**.

    You are prompted to check that no Application Server is associated with the `ORACLE_HOME` that you are about to deinstall.

5. A Warning screen that indicates the directories that will be uninstalled is displayed. Click **Yes** to continue with the deinstallation.

6. On the Deinstallation Complete screen, click **Finish**.

    The `ORACLE_HOME` directory and all of its contents are removed.