Oracle® Fusion Middleware

Installation Guide for Oracle Unified Directory

11*g* Release 2 (11.1.2)

E23737-09

January 2017

ORACLE®

Oracle Fusion Middleware Installation Guide for Oracle Unified Directory, 11*g* Release 2 (11.1.2)

E23737-09

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Contents

Preface

This document guides you through the installation, setup, and uninstallation process for the Oracle Unified Directory. The guide describes installation of the software, setup of the three distinct server modes, and minimal configuration to get started using the server.

Audience

This document is intended for anyone who wants to install an Oracle Unified Directory 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 documentation:

- *Oracle Fusion Middleware Administrator's Guide for Oracle Unified Directory*
- *Oracle Fusion Middleware Developer's Guide for Oracle Unified Directory*
- *Oracle Fusion Middleware Release Notes for Oracle Unified Directory*

Conventions

The following text conventions are used in this document:

Convention	Meaning
boldface	Boldface type indicates graphical user interface elements associated with an action, or terms defined in text or the glossary.

Convention	Meaning
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.

1

Before You Install Oracle Unified Directory

This section includes information that you should review before installing Oracle Unified Directory. It covers the following topics:

1.1 System Requirements and Certification

Before performing any installation, you should read the system requirements and certification documents to ensure that your environment meets the minimum installation requirements for the products you are installing. Both of these documents are available on Oracle Technology Network (OTN):

- *Oracle Fusion Middleware System Requirements and Specifications for Oracle Identity and Access Management*

  This document contains information related to hardware and software requirements, minimum disk space and memory requirements, and required system libraries, packages, or patches.

- `http://www.oracle.com/technetwork/middleware/ias/downloads/fusion-certification-100350.html`

  This document contains information related to supported installation types, platforms, operating systems, databases, JDKs, and third-party products.

1.1.1 Pre-Installation System Notes

On Windows systems you cannot install the Oracle Unified Directory software if you do not have administrator privileges.

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

On UNIX systems, installation as the root user is unsupported.

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.

1.2 Selecting a Server Role

Oracle Unified Directory can function in one of three modes:

- As an LDAP **directory server**, used to contain data.
- As an LDAP **proxy server**, where the server acts as an interface between the client and the directory server that contains the data.
- As a **replication gateway** between Oracle Unified Directory and Oracle Directory Server Enterprise Edition.

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

As a general rule, the use of the generic term *server* applies to the directory server, the proxy server, and the replication gateway.

1.2.1 About the Directory Server

Install the Oracle Unified Directory directory server if you want to create an LDAP directory server that contains directory data. For more information, see Chapter 3, "Setting Up the Directory Server".

1.2.2 About the Proxy Server

When you install Oracle Unified Directory as an LDAP proxy server, the server acts as an interface between the client and the remote LDAP server containing the data. The proxy server manages the client requests through load balancing and/or data distribution. 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).

To install the Oracle Unified Directory in proxy mode, see the procedure in Chapter 4, "Setting Up the Proxy Server".

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 the Oracle Unified Directory directory server or Oracle Directory Server Enterprise Edition.

1.2.3 About the Replication Gateway

When you install Oracle Unified Directory as a replication gateway, the server acts as a gateway that allows you to replicate between Oracle Directory Server Enterprise Edition and Oracle Unified Directory. For more information, see Chapter 5, "Setting Up the Replication Gateway".

1.3 Setting the Java Environment Variable

You must provide Oracle Unified Directory with information about the location of the Java installation that should be used by setting the `JAVA_HOME` environment variable. The setup will not work if the `JAVA_HOME` environment variable is not set, or does not point to the root of a valid (at least Java 1.6) installation.

Note: If you are using IBM WebSphere Application Server and want to use the JVM shipped with IBM WebSphere then you must verify that the JVM is certified with Oracle Unified Directory. For more information, see Section 1.1, "System Requirements and Certification".

For example:

On UNIX Systems, run a command similar to the following, depending on your shell:

```
$ export JAVA_HOME=/usr/lang/JAVA/jre1.6
```

On Windows Systems:

1. Right click on 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 valid Java installation (at least Java 6. For example, C:\Progra~1\Java\jre1.6.0_20
6. Click **OK**.

Note: You can also set the `JAVA_HOME` by running a command similar to the following:

```
set JAVA_HOME=C:\Progra~1\Java\jre1.6.0_20
```

1.4 Understanding the 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
- IBM WebSphere Directory

1.4.1 Oracle Middleware Home Location

This is the directory into 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 by using Oracle Directory Services Manager (ODSM).

If you are using IBM WebSphere as the application server with the Application Development Framework and Oracle Directory Services Manager, specify a directory

that you wish to use as the Middleware home. This directory has no relation to the location of your WebSphere installation. If you specify a directory location that does not already exist, the installer will create the directory for you.

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. It 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 (`MW_HOME`).

1.4.5 IBM WebSphere Directory

When you install the IBM WebSphere software, you are prompted for the location where you want to install the software. For the purposes of this documentation, this location is later referred to as the WAS Home, or `WAS_HOME` in examples.

If you accept the default values that are provided during the installation, then the `WAS_HOME` is installed in the following directory structure:

```
DISK/IBM/WebSphere/Application Server
```

Create the `WAS_HOME` for the IBM WebSphere software on the same host where you plan to install the Oracle Fusion Middleware software. Make a note of this path. You will be asked to identify the location of the IBM WebSphere directory when you configure Oracle Fusion Middleware.

1.5 Directories Summary for Oracle Unified Directory

The directory structure of an Oracle Unified Directory installation on a single host, using all of the default values is as follows:

```
install-dir
                    MW_HOME
                        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: `install-dir`

This can be any directory on your system. The directory is empty before you install the product.

2

Installing the Software

Oracle Unified Directory can be managed by using the command line or by using the graphical Oracle Directory Services Manager (ODSM) interface. ODSM relies on an application server and on the Oracle Application Development Framework, so, if you plan to use ODSM you must install these components.

This chapter describes how to obtain and install Oracle Unified Directory, Oracle WebLogic Server, IBM WebSphere, and the Oracle Application Development Framework. The ODSM bits are installed when you install Oracle Unified Directory but ODSM must be configured when you have installed Oracle WebLogic Server or IBM WebSphere and the Oracle Application Development Framework.

Note: The version of ODSM described in this document is 11.1.2.2.0. ODSM 11.1.2.2.0 can be used to manage Oracle Unified Directory *only*. It cannot be used with Oracle Internet Directory or Oracle Virtual Directory. Versions of ODSM shipped with Oracle Internet Directory or Oracle Virtual Directory cannot be used with 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 Installation Directories".

This section covers the following topics:

2.1 Obtaining the Software

For installing Oracle Unified Directory, you must obtain the following software:

- Oracle Unified Directory 11g Release 2 PS2 (11.1.2.2.0)
- Application Server

Note: If you are managing Oracle Unified Directory using the graphical Oracle Directory Services Manager interface, then you must install an application server.

- Oracle Application Development Framework 11g Release 1 (11.1.1.7.0)

Note: If you are managing Oracle Unified Directory using the Oracle Directory Services Manager interface, then you must install Oracle Application Development Framework. It is required for configuring the application server with Oracle Directory Services Manager.

2.1.1 Oracle Unified Directory 11*g* Release 2 PS2 (11.1.2.2.0)

You can obtain Oracle Unified Directory from the Oracle Software Delivery Cloud Web site as follows:

1. Enter the URL (`https://edelivery.oracle.com`) in a Web browser.
2. If prompted, choose your language and click **Continue**.
3. Complete the Export License Agreement as instructed on the site, and then click **Continue**.
4. On the Media Pack Search page, select **Oracle Fusion Middleware** from the **Select a Product Pack** drop-down list.
5. Select your platform from the **Platform** drop-down list and click **Go**. The Results list shows all products that match your selections.
6. Select the **Oracle Fusion Middleware Identity Management 11g R2 Media Pack** link and click **Continue**.
7. Click the **Download** link for the Oracle Unified Directory 11g 11.1.2.2.0 installer you want to download.

   Each ZIP file has a unique part number.
8. Click **Save**.
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 ZIP file, which contains only the appropriate installer executable for the selected platform, to a directory of your choice.

Note: The Oracle Directory Services Manager bits are installed when you install Oracle Unified Directory. You must configure it with an application server, as described in Section 2.3, "Configuring an Application Server for Oracle Directory Services Manager".

2.1.2 Application Server

If you are configuring the Oracle Unified Directory with the Oracle Directory Services Manager then you must install an application server. The following application servers are supported:

- Oracle WebLogic Server
- IBM WebSphere

For more information, see Section 1.1, "System Requirements and Certification".

2.1.2.1 Oracle WebLogic Server

You can obtain 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/technology/software/products/ias/htdocs/wls_main.html`

For more information, see "Product Distribution" in the *Oracle Fusion Middleware Installation Guide for Oracle WebLogic Server*.

> **Note:** Oracle Unified Directory 11*g* Release 2 (11.1.2) only supports Oracle WebLogic Server Installer 10.3.6.

2.1.2.2 IBM WebSphere

Oracle Unified Directory supports IBM WebSphere Application Server - Network Deployment (ND) 7.0.0.17.

> **Note:** IBM WebSphere only supports Oracle Application Development Runtime 11*g* Release 1 (11.1.1.7.0) or later.

To obtain and install the IBM WebSphere software, refer to the IBM WebSphere documentation available on the WebSphere Application Server Information Center for basic conceptual information about IBM WebSphere, as well as details about installing IBM WebSphere.

At the time this document was published, the latest Fix Pack was Fix Pack 27 (7.0.0.13). For more information, see the WebSphere Application Server Information Center. For more information about the Fix Packs available for IBM WebSphere 7.0, refer to the Fix list for IBM WebSphere Application Server V7.0 on the IBM Support Web site.

Note that this information was valid at the time this document was published. For the most accurate and up-to-date information about the IBM WebSphere Application Server supported by Oracle Fusion Middleware, see the Certification information on the Oracle Technology Network (OTN), as described in Section 1.1, "System Requirements and Certification".

> **Note:** In this guide, IBM WebSphere is used to reference IBM WebSphere Application Server Network Deployment (ND). The specific product names are used when appropriate.

2.1.3 Oracle Application Development Framework 11*g* Release 1 (11.1.1.7.0)

Download the Oracle Application Development Framework from 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. Ensure that you obtained the software, as described in Section 2.1, "Obtaining the Software".
2. Extract the ZIP file, which contains only the appropriate Oracle Unified Directory installer executable for the selected platform, to a directory of your choice. The installer is located in the ZIP file part number directory.
3. Use the `cd` command to move from your present working directory to the directory where you extracted the contents of the zip file to.

   Unix

   ```
   $ cd download-path/oud/Disk1
   ```

   Windows

   ```
   cd download-path\oud\Disk1
   ```

4. Start the Oracle Universal Installer (OUI) by running the `runInstaller` (UNIX) or `setup.exe` (Windows) script, specifying the location of a valid Java installation (at least Java 6).

   Note: Ensure that you do not run the Oracle Unified Directory installer as the root user for Unix.

   On UNIX systems:

   ```
   <full path to the runInstaller directory>/runInstaller -jreLoc <full path to the JRE/JDK directory>
   ```

   For example:

   ```
   ./runInstaller -jreLoc /usr/lang/JAVA/jre1.6.0_35
   ```

   On Windows systems:

   ```
   <full path to the setup.exe directory>\setup.exe -jreLoc <full path to the JRE/JDK directory>
   ```

   For example:

   ```
   C:\oud\Disk1>setup.exe -jreLoc C:\Progra~1\Java\jre1.6.0_35
   ```

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

5. On Unix and Solaris 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 homes 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 machine, 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`.

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

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

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

The **Prerequisite Checks** screen is displayed.

8. 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.

9. Enter the following information:

- **OUD Base Location Home**: Specify a directory that you want to use as the Middleware home, this 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/Middleware`.

- **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.

10. 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.

11. Click **Next**.

    The **Installation Complete** screen is displayed.

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

After you have installed Oracle Unified Directory, you can configure a server instance as a directory server, a proxy server, or a replication gateway. For more information, see Section 1.2, "Selecting a Server Role".

- Instructions for setting up the directory server are described in Chapter 3, "Setting Up the Directory Server".
- Instructions for setting up the proxy server are described in Chapter 4, "Setting Up the Proxy Server".
- Instructions for setting up the replication gateway are described in Chapter 5, "Setting Up the Replication Gateway".

2.2.1 Performing a Silent Installation

Oracle Unified Directory enables you to perform a *silent installation* (that is, an installation that does not require user intervention) by using the set of responses that you provided in an earlier installation. To perform a silent installation, follow steps 1-9 of the previous procedure, then do the following:

1. Click **Save** on the Installation Summary screen.
2. Specify the location to which the response file should be saved, for example `/tmp/oud-install.rsp` (Unix), and click **Save**.
3. When the response file has been saved, cancel the installation.
4. Run the following command to perform the silent installation:

   On Unix

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

On Windows

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

2.3 Configuring an Application Server for Oracle Directory Services Manager

If you plan to manage Oracle Unified Directory with Oracle Directory Services Manager, you must install and configure one of the following application server:

- Oracle WebLogic Server
- IBM WebSphere

This section contains the following topics:

- Configuring Oracle WebLogic Server for Oracle Directory Services Manager
- Configuring IBM WebSphere for Oracle Directory Services Manager

2.3.1 Configuring Oracle WebLogic Server for Oracle Directory Services Manager

If you plan to manage Oracle Unified Directory with Oracle Directory Services Manager, you can install and configure Oracle WebLogic Server by completing the following 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 for Oracle WebLogic Server

2.3.1.1 Installing Oracle WebLogic Server

For information on installing the Oracle WebLogic Server, see "Preparing for Installation" and "Running the Installation Program in Graphical Mode" in 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.
- You must use the existing Middleware home that was created when you installed Oracle Unified Directory.
- Ensure that you obtained the required software, as described in Section 2.1, "Obtaining the Software".
- Ensure that you do not run the Oracle WebLogic installer as the root user for Unix.

2.3.1.2 Installing Oracle Application Development Framework for Oracle WebLogic Server

Oracle Directory Services Manager is a J2EE application that runs inside a Oracle WebLogic Server container and relies on certain libraries that are not installed with the Oracle Unified Directory software. These libraries are provided in the Oracle Application Development Framework. If you plan to manage Oracle Unified Directory with ODSM, you must therefore install the Oracle Application Development Framework.

> **Note:** You must install the Oracle Application Development Framework as the same user who installed Oracle Unified Directory.

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

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

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

1. Run the configuration wizard from the following location:

   ```
   $MW_HOME/oracle_common/common/bin/config.sh
   ```

   On Windows systems, run the comparable `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 - 11.1.2.2.0** check box.

   The 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, if you want 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 systems.

2.3.1.4 Accessing Oracle Directory Services Manager 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 system.

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, the command to run is:

   ```
   domain_home\startWebLogic.cmd
   ```

   The user name and password that are requested here correspond to those in step 6 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>
   ```

2.3.2 Configuring IBM WebSphere for Oracle Directory Services Manager

If you plan to manage Oracle Unified Directory with Oracle Directory Services Manager using IBM WebSphere, then you can install and configure IBM WebSphere by completing the following steps:

Note: For information on the Oracle Fusion Middleware topology for IBM WebSphere, see "Understanding the Topology of Oracle Fusion Middleware on IBM WebSphere" in the *Oracle Fusion Middleware Third-Party Application Server Guide*.

- Installing IBM WebSphere
- Installing Oracle Application Development Framework for IBM WebSphere
- Running Oracle Fusion Middleware Configuration Wizard to Configure Component in a New IBM WebSphere Cell
- Accessing Oracle Directory Services Manager for IBM WebSphere

2.3.2.1 Installing IBM WebSphere

To install and configure Oracle Fusion Middleware with IBM WebSphere, you must first install (but not configure) IBM WebSphere 7.0 and apply the following Fix Packs for IBM WebSphere 7.0:

- `7.0.0-WS-WAS-LinuxX64-FP0000027.pak`
- `7.0.0-WS-WASSDK-LinuxX64-FP0000027.pak`

To install the IBM WebSphere software, refer to the IBM WebSphere documentation. The IBM WebSphere documentation available on the WebSphere Application Server Information Center for basic conceptual information about IBM WebSphere, as well details about installing IBM WebSphere.

You install the Fix Packs using the IBM WebSphere Update Installer. For more information, see the Maintenance Download Wizard for WebSphere Application Server V7.0 on the IBM Support Web site.

Notes:

- IBM WebSphere is available for different platforms. Some platforms, such as Linux 64-bit platforms, require unique IBM WebSphere installers. Before you begin your IBM WebSphere installation, be sure you have obtained the correct IBM WebSphere installer for your platform.
- Do not install any sample applications or create any profiles during the IBM WebSphere installation process. The goal is to install the IBM WebSphere software on disk in a directory available to the Oracle Fusion Middleware software installation, which you will perform later. You will use the Oracle Fusion Middleware Configuration wizard to configure the required IBM WebSphere profiles.
- You must create the `WAS_HOME` for the IBM WebSphere software on the same host where you installed Oracle Unified Directory. `WAS_HOME` should be at the same level as `MW_HOME`.

2.3.2.2 Installing Oracle Application Development Framework for IBM WebSphere

Oracle Directory Services Manager is a J2EE application that runs inside a IBM WebSphere container and relies on certain libraries that are not installed with the Oracle Unified Directory software. These libraries are provided in the Oracle Application Development Framework. If you plan to manage Oracle Unified Directory

with ODSM, you must therefore install the Oracle Application Development Framework.

> **Note:** You must install the Oracle Application Development Framework as the same user who installed Oracle Unified Directory.

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

2.3.2.3 Running Oracle Fusion Middleware Configuration Wizard to Configure Component in a New IBM WebSphere Cell

This section describes how to use the Configuration Wizard to configure your Oracle Directory Services Manager in a simple IBM WebSphere cell.

For more information on Oracle Fusion Middleware Configuration Wizard for IBM WebSphere, see "Configuration Overview" in the *Oracle Fusion Middleware Configuration Guide for IBM WebSphere Application Server*.

The instructions here describe how to use the Configuration Wizard to configure your components. However, you can also use the IBM WebSphere `wsadmin` command-line utility to configure your Oracle Fusion Middleware components. For more information about configuring components with `wsadmin`, see "Using wsadmin to Configure Oracle Fusion Middleware" in the *Oracle Fusion Middleware Configuration Guide for IBM WebSphere Application Server*.

> **Notes:**
>
> - If you are using a DB2 database, prior to starting the Configuration Wizard for the first time to configure Oracle Fusion Middleware products, set the `DB_DRIVER_CLASSPATH` environment variable to include the full path to both `db2jcc4.jar` and `db2jcc_license_cu.jar`. If you do not do this, all DB2 connection tests will fail.
> - Be sure to make a note of the values you enter on the Specify Cell, Profile, and Node Name Information screen. You will need these later when you are starting and managing the cell. In particular, make note of the values you enter in the Deployment Manager Profile Name field and the Application Server Profile Name field.

1. To start the Configuration Wizard in graphical mode from a Windows command prompt or a UNIX command shell:
   a. Log in to the system on which the product is installed.
   b. Open an MS-DOS command prompt window (on Windows) or a command shell (on UNIX).

   > **Note:** On some Windows operating systems, if you have User Account Control (UAC) enabled, you may have to start the command window using the Run as Administrator command. Otherwise, you may not be able to create a cell or federate a node.

c. Go to the following directory:

   – **Windows:** `MW_HOME\oracle_common\common\bin\`

   – **UNIX:** `MW_HOME/oracle_common/common/bin`

   Replace *`ORACLE_HOME`* with the directory in which you installed your Oracle Fusion Middleware products.

d. Run the following command:

   – **Windows:** `was_config.cmd`

   – **UNIX:** `./was_config.sh`

   The **Welcome** screen is displayed.

   This screen appears only if the current IBM WebSphere installation is invalid, or IBM WebSphere was uninstalled after you installed your Oracle Fusion Middleware products.

Note: To create a log file of the Configuration Wizard session, include the `-log=config.log -priority=debug` parameter in the command. You can specify any file name for the log file, such as `config_today.log`. The log file is stored in the *`logs`* directory of the Oracle Middleware home directory.

---

2. Click **Browse** to navigate to the home directory for the IBM WebSphere installation for which you want to configure a new cell, update an existing cell, or federate a machine. After navigating to the directory, click **Open**.

   Click **Next** to Continue.

   The **Select Configuration Option** screen is displayed.

3. Select **Create and Configure Cell** to create a new cell.

   Click **Next**.

   The **Specify Cell, Profile and Node Name Information** screen is displayed.

4. Enter the appropriate values in the following fields. Each field is required. Use only alphanumeric characters in each field.

   - **Cell Name**: Enter a unique name for the new cell. This is the name of the directory in which the cell is created, under the following two directories:

     – **IBM WebSphere ND only**: *`WAS_HOME`*`/profiles/`*`DepMgrProfile`*`/config/cells`, where *`WAS_HOME`* is the IBM WebSphere ND installation directory and *`DepMgrProfile`* is the name of the Deployment Manager profile.

     – **Both IBM WebSphere AS and IBM WebSphere ND**: *`WAS_HOME`*`/profiles/`*`AppSrvrProfile`*`/config/cells`, where *`WAS_HOME`* is the IBM WebSphere installation directory and *`AppSrvrProfile`* is the name of the Application Server profile.

     The default name is *machine_name*Cell*n*, where *machine_name* is the name of the current machine, and *n* is the next two-digit number in the sequence on that machine. For example, if the machine name is machine1 and Cell01 already exists, the default cell name is machine1Cell02.

- **Deployment Manager Profile Name**: Enter a unique Deployment Manager profile name for this cell. This is the name of the directory in which the Deployment Manager profile is created, under *WAS_HOME*/profiles.

  The default name is Dmgr*n*, where *n* is the next two-digit number in the sequence. For example, if Deployment Manager profile Dmgr01 already exists, the default for this field is Dmgr02.

- **Deployment Manager Node Name**: Enter a unique Deployment Manager node name for this cell.

  The default name is *machine_name*CellManager*n*, where *machine_name* is the name of the current machine, and *n* is the next two-digit number in the sequence. For example, if the machine name is machine1 and CellManager01 already exists, the default node name is machine1CellManager02.

- **Application Server Profile Name**: Enter a unique Application Server profile name for this cell. This is the name of the directory in which the Application Server profile is created, under *WAS_HOME*/profiles.

  The default name for IBM WebSphere ND is Custom*n*, where *n* is the next two-digit number in the sequence. For example, if Application Server profile Custom01 already exists, the default for this field is Custom02.

- **Application Server Node Name**: Enter a unique Application Server node name for this cell.

  The default name is *machine_name*Node*n*, where *machine_name* is the name of the current machine, and *n* is the next two-digit number in the sequence on the machine. For example, if the machine name is machine1 and Node01 already exists, the default node name is machine1Node02.

Click **Next**.

The **Specify Deployment Manager Information** screen is displayed.

5. Enter the following details:

   - **Deployment Manager Host Name**: When you are creating a new cell, this field defaults to the host name of the current machine.

     When you are federating a machine, enter the host name of the Deployment Manager that will manage the remote node.

   - **Admin User Name**: When creating a new cell, enter the administrator user name that you want to use to start or stop the Deployment Manager.

     When you are federating a machine, enter the administrator user name that was configured for the Deployment Manager on the specified host.

   - **Password**: When you are creating a new cell, enter the administrator password that you want to use for the cell.

     When you are federating a machine, enter the administrator password that was configured for the Deployment Manager on the specified host.

     Note: The password for the IBM WebSphere Administrator account. The password must be at least eight characters, and must contain at least one numeric character or at least one of the following characters:

     ```
     ! " # $ % & ' ( ) * + , - . / : ; < = > ? @ [ \ ] ^
     _ ` { | } ~
     ```

- **Confirm Password**: This field is displayed only when you are creating a new cell. Reenter the administrator password to confirm it. This entry must exactly match the entry in the **Password** field.

Note: The Administrator user name and password that you enter here are used to connect to the Deployment Manager, and to stop the Deployment Manager, Node Managers, Administration Server, or Application Servers.

Click **Next**.

The **Cell Progress** screen is displayed.

6. This screen displays the status of the cell creation, cell loading, or federating machine process. The screen title differs depending on your current task:
   - When you are creating a new cell, the screen title is Creating Cell.
   - When you are updating an existing cell, the screen title is Loading Cell Information.
   - When you are federating a remote machine to a cell, the screen title is Federating Machine.

   When the progress bar reaches 100% and the message **Cell information read successfully, please click Next** is displayed in the lower window, click **Next**.

   The **Add Products to Cell** screen is displayed.
7. Select **Oracle Directory Services Manager for WebSphere - 11.1.2.2.0 [Oracle_common]** and click **Next** to continue.

   The **Select Optional Configuration** screen is displayed.
8. Select the categories (if any) for which you want to perform advanced configuration. For each category that you select, the appropriate configuration screen is displayed to allow you to perform advanced configuration. If you do not select any items on this screen, the Configuration Summary screen is displayed next.

Notes: The categories that are listed on this screen depend on the resources defined in the templates that you selected for the cell.

- **Application Servers, Clusters and End Points**: Select this option to perform any of the following tasks:
  - Add, delete, or clone an Application Server
  - Change the name of an Application Server
  - Toggle development mode on or off for an Application Server
  - Add clusters to the cell, and add servers to a cluster
  - Configure end points (ports) for the Administration Server or any Application Server
  - Change the file store shared directory locations for your clusters, including the log directory, permanent store directory, and temporary store directory

- **Deployments and Services**: Select this option to perform any of the following tasks.
  - Change the deployment targets for your clusters or servers
  - Change the service targets for your clusters or servers
  - Change the custom service targets for your servers
  - Change the resource adapter targets for your servers
- **JDBC**: Select this option to change the JDBC data source targets for your clusters or servers.
- **JMS**: Select this option to change the JMS resource targets for your clusters or servers.

After selecting the appropriate configuration options, click **Next** to continue. The screen that is displayed next differs depending on the options that you selected.

The **Configuration Summary** screen is displayed.

9. Review the detailed configuration settings of your cell before continuing.

   In the **Summary** section on the left, select an item to display details about that item in the **Details** section on the right.

   You can limit the items that are displayed in the **Summary** section by selecting a filter option from the **Summary View** list. For example, to view the JDBC data sources that are assigned to each of your clusters and servers, select **JDBC** from the **Summary View** list.

   To change the configuration, click **Previous** to return to the appropriate screen.

   When you are done reviewing the configuration, click:

   - **Create** (if you are creating a new cell)
   - **Extend** (if you are modifying an existing cell or federating a machine)

   The **Configuring Cell** screen is displayed.

10. This screen shows the progress of the cell configuration process.

    When the cell configuration process completes, click **Done** to close the Configuration Wizard.

    On Windows operating systems, to start the Deployment Manager after closing the Configuration Wizard, select the **Start Deployment Manager** check box. This check box is not available on UNIX operating systems.

2.3.2.4 Accessing Oracle Directory Services Manager for IBM WebSphere

When you have created the IBM WebSphere domain, as described previously, you can start the IBM WebSphere Deployment Manager, Node, and Oracle Directory Services Manager.

The following procedure shows the sequence you must use to start the deployment manager, the node, and the servers in the cell.

In the following examples, replace the names of the deployment manager and profile name with the values you entered in the Configuration Wizard in Section 2.3.2.3, "Running Oracle Fusion Middleware Configuration Wizard to Configure Component in a New IBM WebSphere Cell":

1. Start the Deployment Manager:

Navigate to the following directory in the IBM WebSphere home and enter the following command:

```
(UNIX) profiles/deployment_mgr_name/bin/startManager.sh
                -profileName dmgr_profileName
(Windows) profiles\deployment_mgr_name\bin\startManager.cmd
                -profileName dmgr_profileName
```

2. Start the node:

   Navigate to the following directory in the IBM WebSphere home and enter the following command:

   ```
   (UNIX) profiles/profile_name/bin/startNode.sh -profileName profileName
   (Windows) profiles\profile_name\bin\startNode.cmd -profileName profileName
   ```

3. Start the OracleAdminServer server:

   Navigate to the following directory in the IBM WebSphere home and enter the following command:

   ```
   (UNIX) profiles/profile_name/bin/startServer.sh OracleAdminServer
          -profileName profileName
   (Windows) profiles\profile_name\bin\startServer.cmd OracleAdminServer
          -profileName profileName
   ```

4. Access Oracle Directory Services Manager through a browser, using the following URL:

   ```
   http://hostname:9003/odsm
   ```

   where *hostname* is the name of the server on which IBM WebSphere is installed. 9003 is the ODSM port.

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.

You can configure Oracle Unified Directory, Oracle Directory Services Manager, Oracle Directory Integration Platform, and Fusion Middleware Control in an Oracle WebLogic Server domain, as described in the section "Configuring OUD/ODSM/ODIP/Fusion Middleware Control and OVD/ODSM" in the *Oracle Fusion Middleware Installation Guide for Oracle Identity Management*.

For more information, see *Oracle Fusion Middleware Administrator's Guide for Oracle Directory Integration Platform*.

3

Setting Up the Directory Server

This chapter describes how to set up a directory server instance, by using either the graphical user interface (GUI) or the command line interface. The topics in this chapter assume that you have already installed the software, as described in Chapter 2, "Installing the Software".

You can set up the directory server in two ways:

- **Graphical user interface (GUI)**. The 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.

- **Command-line interface (CLI)**. The command-line 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.

This chapter covers the following topics:

3.1 Setting up the Directory Server by Using the GUI

The following procedure presents a step by step installation using the `oud-setup` graphical interface.

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

   ```
   (UNIX, Linux)  $ cd OUD-base-location/ORACLE_HOME
   (Windows)      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-setup` command to configure the directory server installation.

   ```
   (UNIX, Linux)  $ oud-setup
   (Windows)      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 platforms, 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, see "Managing Administration Traffic to the Server" in *Oracle Fusion Middleware Administrator's Guide for Oracle Unified Directory*.

   - **LDAP Secure Access**: If you want 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 platforms, 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 can be used to secure the communication. While this 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 certificates, see "Configuring Key Manager Providers" in *Oracle Fusion Middleware Administrator's Guide for 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:
   - **No specific integration**: Select this option if you want a standard installation. This is the default option.
   - **Enable for EUS (Enterprise User Security)**: Select this option if you want this server instance to be used as a datastore for Oracle Enterprise User Security.

Note that you can only enable a server instance for EUS if you have enabled SSL access (Described in the Server Settings screen in Step 5 this procedure).

When you enable a server instance for EUS, the following naming contexts are created on the instance:

```
cn=oraclecontext

cn=oracleschemaversion

cn=subschemasubentry

cn=oraclecontext,<baseDN>
```

- **Enable for Oracle Database Net Services**: Select this option if you want this server to store the database connect identifiers.

  When you enable a server instance for Oracle Database Net Services, the following naming contexts are created on the instance:

  ```
  cn=oraclecontext

  cn=subschemasubentry

  cn=oraclecontext,<baseDN>
  ```

  For more information, see "Configuring the Directory Naming Method" in the *Oracle Database Net Services Administrator's Guide*.

Click **Next**.

The **Server Tuning** screen is displayed.

9. Select one of the following:

   - **Providing Runtime Options**: Click **Change** to configure any specific JVM setting, or click **Next** to run the server with the default JVM settings.

     For more information, see Section 7.2, "Configuring the Java Runtime Settings During Installation".

   - **Automatic**: Select this option, if you want to run a single instance of the server on the system.

     The OUD server will be tuned automatically at startup depending on the system resources. Oracle recommends this option to get improved performance when you run a single instance of the server on the system.

   - **Providing Memory Limits**: Specify the memory usage of the server, and the server JVM settings are tuned accordingly.

     Select **Use Same Memory Settings for Offline Tools** check box, if you want to specify the same memory limitation to apply to various command-line options, such as `import-ldif`, `export-ldif`, `verify-index`, and `rebuild-index`.

   - **Providing LDAP Data Information**: Select one of the following option:

     – **Tune based on the data to be imported automatically**: Select this option, if you want to tune the server based on data the server will contain after the setup is complete.

Note: This option will not be available, if you have selected the following data option in the Directory Data Screen:

- **Only Create Base Entry**
- **Leave Database Empty**

Tune based on the contents of the LDIF file to be imported: This option appears if you have selected **Import Data from LDIF File** in the Directory Data screen. Select this option, if you want to tune the server based on data the server will contain after the setup is complete.

– **Use the Contents of an LDIF File to Tune the Server**: Click **Browse** and specify the path of the LDIF file containing the data for tuning the server.

– **Use the Number of Entries to Tune the Server**: Enter the number of entries that the server will contain and their average size for tuning.

If you select the **Other** option as the size then the **Other Size** screen is displayed.

Enter an average size for your entries in kilobytes or an example LDAP entry in LDIF format. Click **OK**.

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 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 by Using the CLI

Running `oud-setup` with the `--cli` option launches the command-line setup, as described in the following procedure.

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

   ```
   (UNIX, Linux)  $ cd OUD-base-location/ORACLE_HOME
   (Windows)      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.

   ```
   (UNIX, Linux)  $ ./oud-setup --cli
   (Windows)      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 re-enter 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, see "Managing Administration Traffic to the Server" in *Oracle Fusion Middleware Administrator's Guide for 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` if you want 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` if you want to enable StartTLS.

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

14. Type `yes` if you want to prepare the server for EUS. This will enable the server instance to be used as a datastore for Oracle Enterprise User Security.

    Note that you can only prepare the server for EUS if you have enabled SSL access to the server.

    When you enable a server instance for EUS, the following naming contexts are created on the instance:

    - `cn=oraclecontext`
    - `cn=oracleschemaversion`
    - `cn=subschemasubentry`
    - `cn=oraclecontext,<baseDN>`

15. Type `yes` if you want this server to store the database connect identifiers for Oracle Database Net Services.

    When you enable a server instance for Oracle Database Net Services, the following naming contexts are created on the instance:

    `cn=oraclecontext`

    `cn=subschemasubentry`

    `cn=oraclecontext,<baseDN>`

    For more information, see "Configuring the Directory Naming Method" in the *Oracle Database Net Services Administrator's Guide*.

16. Enter an option depending on how you want to tune the OUD server:

    - `Automatic Tuning`
    - `Use the default Java Virtual Machine settings`
    - `Use specific Java Virtual Machine arguments`

    Select `Automatic Tuning` option, if you want to run a single instance of the server on the system. The OUD server will be tuned automatically at startup depending on the system resources. Oracle recommends this option to get improved performance when you run a single instance of the server on the system.

17. Enter an option depending on how you want to tune the import-ldif tool:

    - `Automatic Tuning`
    - `Use the default Java Virtual Machine settings`
    - `Use specific Java Virtual Machine arguments`

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

19. 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.

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

    On UNIX:

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

    On Windows:

    ```
    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 by using the GUI, you can set up replication as part of the installation. If you install the server by using the command-line interface, you must set up replication by using the `dsreplication` command after the server is installed. For more information, see "Configuring Data Replication With dsreplication" in *Oracle Fusion Middleware Administrator's Guide for 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 by Using the 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** if you want 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 by Using the 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 the Proxy Server

This chapter describes the configuration steps that are necessary to get an Oracle Unified Directory proxy instance up and running. The chapter provides an overview of the tested Oracle Unified Directory proxy deployments. Other deployments are possible, but might not have been tested extensively. For a description of the tested deployments, see *Example Deployments Using the Proxy Server,* in the *Oracle Fusion Middleware Administrator's Guide for Oracle Unified Directory*.

To set up the 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 *Configuring Global Indexes By Using the Command Line* in *Oracle Fusion Middleware Administrator's Guide for Oracle Unified Directory*.

You can set up the proxy in two ways:

- **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. If you want to modify an installation after you have run the GUI setup, you must use the `dsconfig` command.

- **Command-line interface (CLI).** The interactive command-line setup prompts you for the first few steps of the Oracle Unified Directory proxy installation. To complete the deployment, you must configure a number of additional elements (such as distribution and/or load balancing) using the `dsconfig` command.

This chapter covers the following topics:

- Section 4.3, "Duplicating a Proxy Installation"
- Section 4.4, "Ensuring Redundancy"

4.1 Setting Up the Proxy Server by Using the GUI

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

Before you run the command, make sure that you have determined the best deployment architecture, using the deployment scenarios that are described in *Example Deployments Using the Proxy Server*, in *Oracle Fusion Middleware Administrator's Guide for Oracle Unified Directory*.

- Section 4.1.1, "Presentation of the GUI Setup Wizard"
- Section 4.1.2, "To Configure Simple Load Balancing"
- Section 4.1.3, "To Configure Simple Distribution"
- Section 4.1.4, "To Configure Distribution with Load Balancing"
- Section 4.1.5, "To Configure Enterprise User Security"

4.1.1 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.

4.1.2 To Configure Simple Load Balancing

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

   ```
   (UNIX, Linux)  $ cd OUD-base-location/ORACLE_HOME
   (Windows)      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.

   ```
   (UNIX, Linux)  $ oud-proxy-setup
   (Windows)      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 platforms, if you run the installer as a non-root user, the default is 1389, if available.
   - **LDAP Secure Access**: If you want 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 platforms, 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, see *Managing Administration Traffic to the Server* in *Oracle Fusion Middleware Administrator's Guide for 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)**: Re-enter 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 hostname, 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 *Configuring Security Between the Proxy and the Data Source,* in *Oracle Fusion Middleware Administrator's Guide for 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 *Load Balancing Using the Proxy* in *Oracle Fusion Middleware Administrator's Guide for 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, see *Modifying Load Balancing Properties* in *Oracle Fusion Middleware Administrator's Guide for 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 as well as 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 *Managing the Server Configuration With*

dsconfig in *Oracle Fusion Middleware Administrator's Guide for Oracle Unified Directory*.

4.1.3 To Configure Simple Distribution

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

   ```
   (UNIX, Linux)  $ cd OUD-base-location/ORACLE_HOME
   (Windows)      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.

   ```
   (UNIX, Linux)  $ oud-proxy-setup
   (Windows)      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 platforms, if you run the installer as a non-root user, the default is 1389, if available.

   - **LDAP Secure Access**: If you want 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 platforms, 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, see *Managing Administration Traffic to the Server* in the *Oracle Fusion Middleware Administrator's Guide for 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, see *Data Distribution Using the Proxy* in *Oracle Fusion Middleware Administrator's Guide for 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 *DN Pattern String Syntax* in *Oracle Fusion Middleware Administrator's Guide for Oracle Unified Directory*.

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

For example, for partition 1, `From=A, To=K`. This means that `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`. This means that `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, see *To Create a Global Index Catalog Containing Global Indexes* in *Oracle Fusion Middleware Administrator's Guide for 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 *Configuring Global Indexes By Using the Command Line* in *Oracle Fusion Middleware Administrator's Guide for 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 hostname, 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, see *Configuring Security Between the Proxy and the Data Source,* in *Oracle Fusion Middleware Administrator's Guide for 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, see *Managing the Server Configuration With dsconfig* in *Oracle Fusion Middleware Administrator's Guide for Oracle Unified Directory*.

4.1.4 To Configure Distribution with Load Balancing

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

```
(UNIX, Linux)  $ cd OUD-base-location/ORACLE_HOME
(Windows)      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.

```
(UNIX, Linux)  $ oud-proxy-setup
(Windows)      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 platforms, if you run the installer as a non-root user, the default is `1389`, if available.

- **LDAP Secure Access**: If you want 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 platforms, 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, see *Managing Administration Traffic to the Server* in *Oracle Fusion Middleware Administrator's Guide for 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, see *Data Distribution Using the Proxy* in *Oracle Fusion Middleware Administrator's Guide for 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 *DN Pattern String Syntax* in *Oracle Fusion Middleware Administrator's Guide for Oracle Unified Directory*.

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

For example, for partition 1, `From=A, To=K`. This means that `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`. This means that `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 *To Create a Global Index Catalog Containing Global Indexes* in *Oracle Fusion Middleware Administrator's Guide for 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 *Configuring Global Indexes By Using the Command Line* in *Oracle Fusion Middleware Administrator's Guide for 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 hostname, 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, see *Configuring Security Between the Proxy and the Data Source,* in *Oracle Fusion Middleware Administrator's Guide for 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, see *Modifying Load Balancing Properties* in *Oracle Fusion Middleware Administrator's Guide for 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 as well as 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 Runtime Settings During Installation.

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 *Managing the Server Configuration With dsconfig* in *Oracle Fusion Middleware Administrator's Guide for Oracle Unified Directory*.

4.1.5 To Configure Enterprise User Security

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

```
(UNIX, Linux)  $ cd OUD-base-location/ORACLE_HOME
(Windows)      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.

```
(UNIX, Linux)  $ oud-proxy-setup
(Windows)      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**.

The **Server Settings screen** is displayed.

5. 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 platforms, if you run the installer as a non-root user, the default is `1389`, if available.

– **LDAP Secure Access**: Click **Configure**, to configure SSL.

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 platforms, if you run the installer as a non-root user, the default is `1636`, if available.

b. 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.

c. Click **OK**.

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

The default administration port is `4444`. For more information, see "Managing Administration Traffic to the Server" in *Oracle Fusion Middleware Administrator's Guide for 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)**: Re-enter the root user bind password.

Click **Next** to continue.

The **Deployment Options** screen is deployed.

6. Select **Configure EUS** 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 Server Type** screen is displayed.

7. Select the type of LDAP server storing the user identities.

Click **Next**.

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

8. Select the remote LDAP servers containing EUS users and groups.

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

a. For Oracle Unified Directory servers:

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

Enter the hostname, 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 replicated 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**.

b. 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 replicated topology.

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

Click **OK**.

– 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, see *Configuring Security Between the Proxy and the Data Source,* in *Oracle Fusion Middleware Administrator's Guide for Oracle Unified Directory*.

b. Click **Add**.

c. 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.

This screen appears only if you have selected multiple LDAP servers.

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, see *Modifying Load Balancing Properties* in *Oracle Fusion Middleware Administrator's Guide for Oracle Unified Directory*.

– 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.

– 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.

– For saturation, set the order in which the servers are used as well as 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.

For information about the various load balancing algorithms, see *Load Balancing Using the Proxy* in *Oracle Fusion Middleware Administrator's Guide for Oracle Unified Directory*.

The **Naming Contexts** screen is displayed.

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 **Add**.

    Click **Next**.

    The **Runtime options** screen is displayed.

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

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 *Managing the Server Configuration With dsconfig* in *Oracle Fusion Middleware Administrator's Guide for Oracle Unified Directory*.

Configure EUS Context

You must configure the EUS context for each EUS suffix that you have defined as follows:

1. Create a copy of `eusData.ldif` file located at `install_dir\config\EUS\` (Windows) or `install_dir/config/EUS/` (Unix).

   For example, the Root User DN is `cn=directory manager` and the following EUS suffixes are created:

   - `dc=eus A`
   - `dc=eus B`

   The file `/tmp/password.txt` contains the password of the Root User DN and `4444` is the default administration port of the OUD instance.

   Create two copies of `eusData.ldif file` as follows:

   - `/tmp/eusDataA.ldif`
   - `/tmp/eusDataB.ldif`

2. Open the `eusData.ldif` file in a text editor and do the following:

- Replace the occurrence of `dc=example and dc=com` by the DN of the EUS suffix.
- Replace the occurrence of `cn=orcladmin` by the Root User DN that you provided during the setup.

For example, you must do the following:

- Replace `cn=orcladmin` with `cn=directory manager` in `eusDataA.ldif` and `eusDataB.ldif` files.
- In the `eusDataA.ldif` file replace `dc=example` and `dc=com` with `dc=eus A`.
- In the `eusDataB.ldif` file replace `dc=example` and `dc=com` with `dc=eus B`.

3. You must import the content of the files by running the following command:

Windows:

```
OUD_INSTANCE_ROOT\OUD\bin\import-ldif -n oraclecontextSUFFIX_NUMBER -l /
PATH_OF_THE_EDITED_FILE -F --hostname OUD_HOST_NAME --port
OUD_ADMINISTRATION_PORT /
--bindDN OUD_ROOT_USER_DN --bindPasswordFile
PATH_OF_FILE_WITH_OUD_ROOT_USER_PASSWORD
```

Unix:

```
OUD_INSTANCE_ROOT/OUD/bin/import-ldif -n oraclecontextSUFFIX_NUMBER -l \
PATH_OF_THE_EDITED_FILE -F --hostname OUD_HOST_NAME --port
OUD_ADMINISTRATION_PORT \
--bindDN OUD_ROOT_USER_DN --bindPasswordFile
PATH_OF_FILE_WITH_OUD_ROOT_USER_PASSWORD
```

For example, import the content of `eusDataA.ldif` file as follows:

Note: The backend ID is `1`. For example, `oraclecontext1`.

Windows:

```
<OUD_INSTANCE_ROOT>\OUD\bin\import-ldif -n oraclecontext1 -l
\tmp\eusDataA.ldif -F --hostname localhost --port 4444 --bindDN "cn=directory
manager" --bindPasswordFile \tmp\password.txt
```

Unix:

```
<OUD_INSTANCE_ROOT>/OUD/bin/import-ldif -n oraclecontext1 -l
/tmp/eusDataA.ldif -F --hostname localhost --port 4444 --bindDN "cn=directory
manager" --bindPasswordFile /tmp/password.txt
```

Import the content of `eusDataB.ldif` file as follows:

Note: The backend ID is `2`. For example, `oraclecontext2`.

Windows:

```
<OUD_INSTANCE_ROOT>\OUD\bin\import-ldif -n oraclecontext2 -l
\tmp\eusDataB.ldif -F --hostname localhost --port 4444 --bindDN "cn=directory
manager" --bindPasswordFile \tmp\password.txt
```

Unix:

```
<OUD_INSTANCE_ROOT>/OUD/bin/import-ldif -n oraclecontext2 -l
/tmp/eusDataB.ldif -F --hostname localhost --port 4444 --bindDN "cn=directory
manager" --bindPasswordFile /tmp/password.txt
```

4.2 Setting Up the Proxy by Using the CLI

Running the `oud-proxy-setup` in command-line mode defines the proxy port, host name, and security configuration.

To complete the deployment and to configure load balancing or distribution, you must use `dsconfig`, as described in *Managing the Proxy Configuration With dsconfig* in *Oracle Fusion Middleware Administrator's Guide for Oracle Unified Directory*, or the ODSM interface, as described in *Managing the Proxy Configuration With ODSM* in *Oracle Fusion Middleware Administrator's Guide for Oracle Unified Directory*.

You can also use a common properties file to provide default values for options. For more information, see *Using a Properties File With Server Commands* in *Oracle Fusion Middleware Administrator's Guide for Oracle Unified Directory*.

4.2.1 To Set Up the Proxy by 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 prior to completing the installation. The commands displayed by the install wizard are a good starting point for scripting an installation. For information about how to do this, see Section 4.3, "Duplicating a Proxy Installation,".

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

   ```
   (UNIX, Linux)  $ cd OUD-base-location/ORACLE_HOME
   (Windows)      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. Type `oud-proxy-setup` with the `--cli` option, specifying the server details as follows:

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

   In the preceding example, `-p` is the proxy LDAP port that is used to send data between the client and the proxy, `--adminConnectorPort` is the proxy administration port, `-D` is the bind DN, and `-j` is the file containing the proxy LDAP bind password.

   The utility launches the command—line 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
```

Note: You can configure EUS in `cli` mode, by specifying the following option while launching the installer:

```
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 so on.

   The list of components to be configured will depend on your deployment architecture. For examples based on the supported use cases, see *Example Proxy Configurations*, in *Oracle Fusion Middleware Administrator's Guide for Oracle Unified Directory*.

4.3 Duplicating a Proxy Installation

To set up a replicated Oracle Unified Directory proxy, you must duplicate your Oracle Unified Directory proxy installation.

4.3.1 To Duplicate 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 prior to 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 machine 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.

```
(UNIX, Linux)  $ cd OUD-base-location/ORACLE_HOME
(Windows)      C:\> cd OUD-base-location\ORACLE_HOME
```

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

4.3.2 To Duplicate 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 machine 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.

```
(UNIX, Linux)  $ cd OUD-base-location/ORACLE_HOME
(Windows)      C:\> cd OUD-base-location\ORACLE_HOME
```

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

4.4 Ensuring Redundancy

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, see *Multiple Replicated Proxies* in *Oracle Fusion Middleware Administrator's Guide for Oracle Unified Directory*.

5

Setting Up the Replication Gateway

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.

You can set up the replication gateway in two ways:

- **Graphical user interface (GUI).** The GUI setup uses a Java-based graphical installer that enables you to set up and configure the replication gateway in very little time.
- **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. It is preferable to set up the replication gateway by using the GUI.

This chapter covers the following topics:

5.1 Before You Set Up the 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, see "Replicating Between Oracle Directory Server Enterprise Edition and Oracle Unified Directory" in the *Administration Guide for 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 by Using the GUI

The following procedure walks you through setting up a replication gateway server instance by using the graphical user interface.

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

   ```
   (UNIX, Linux)  $ cd OUD-base-location/OUD_ORACLE_HOME
   (Windows)      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.

   ```
   (UNIX, Linux)  $ oud-replication-gateway-setup
   (Windows)      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, 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, see "Replicating Between Oracle Directory Server Enterprise Edition and Oracle Unified Directory" in the *Administration Guide for 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, see *Managing Administration Traffic to the Server* in *Oracle Fusion Middleware Administrator's Guide for 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 checkbox.
     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 checkbox and click Change to configure the certificate.
   - 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, see *Managing Administration Traffic to the Server* in *Oracle Fusion Middleware Administrator's Guide for 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, see *Replicating Between Oracle Directory Server Enterprise Edition and Oracle Unified Directory* in *Oracle Fusion Middleware Administrator's Guide for Oracle Unified Directory*.
16. Click **Finish** to complete the setup.

5.3 Setting Up the Replication Gateway By Using the CLI

To set up the replication gateway on the command line, type the following command:

```
$ 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 is useful if 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 detailed information about all of the command-line options, see "oud-replication-gateway-setup" in the *Oracle Fusion Middleware Administrator's Guide for 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 to 11*g* Release 2 PS2 (11.1.2.2.0)

This chapter covers a broad strategy for updating your directory service to the latest version, without service interruption, as well as the steps for updating an individual server instance.

The chapter covers the following topics:

6.1 What's New in Oracle Unified Directory 11*g* Release 2 PS2 (11.1.2.2.0)

For more information, see "New Features Introduced with Oracle Unified Directory 11g Release 2 PS2 (11.1.2.2.0)" in the *Oracle Fusion Middleware Administrator's Guide for Oracle Unified Directory*.

6.2 Starting Points for Oracle Unified Directory Update

The following starting points are supported:

- 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 PS1 (11.1.2.1.0)

6.3 Special Instructions for Updating to Oracle Unified Directory 11*g* Release 2 PS2 (11.1.2.2.0)

The following components are not updated to the Oracle Unified Directory 11*g* Release 2 PS2 (11.1.2.2.0) environment:

- Global Index Catalogs configured using `gicadm`: You cannot update 11*g* Release 1 (11.1.1.5) or 11*g* Release 2 (11.1.2.0) global index catalogs configuration. After updating to Oracle Unified Directory 11*g* Release 2 PS2 (11.1.2.2), you must

reconfigure global index catalogs using `gicadm` as described in the section "Configuring Global Index Catalogs by Using gicadm" in the *Oracle Fusion Middleware Administrator's Guide for Oracle Unified Directory*.

- You cannot update earlier versions of Oracle Directory Services Manager to Oracle Unified Directory 11*g* Release 2 PS2 (11.1.2.2.0). You must update Oracle Directory Services Manager as described in Section 6.6, "Updating Oracle Directory Services Manager".

6.4 Updating a Directory Service Without Service Interruption

Updating a replicated Oracle Unified Directory topology involves updating the software for each server instance individually. Usually, however, you should be able to update an entire topology without any interruption in service. Because a particular server instance must be stopped during the update process, maintaining service during an update necessitates that you have alternative servers that can handle client requests while a particular server is down.

The strategy for maintaining service during an update depends on the specifics of your deployment.

If your deployment includes one or more proxy server instances that route client requests to the backend servers, you can safely take down one directory server at a time, and update that server instance. The proxy server will take care of rerouting 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 in each of the scenarios described previously:

- Section 6.4.1, "Upgrading in a Topology That Includes a Proxy Server"
- Section 6.4.2, "Upgrading in a Topology That Does Not Include a Proxy Server"

6.4.1 Upgrading in a Topology That Includes a Proxy Server

The following diagrams show two replicated topologies that include replicated proxy servers. This section covers two scenarios:

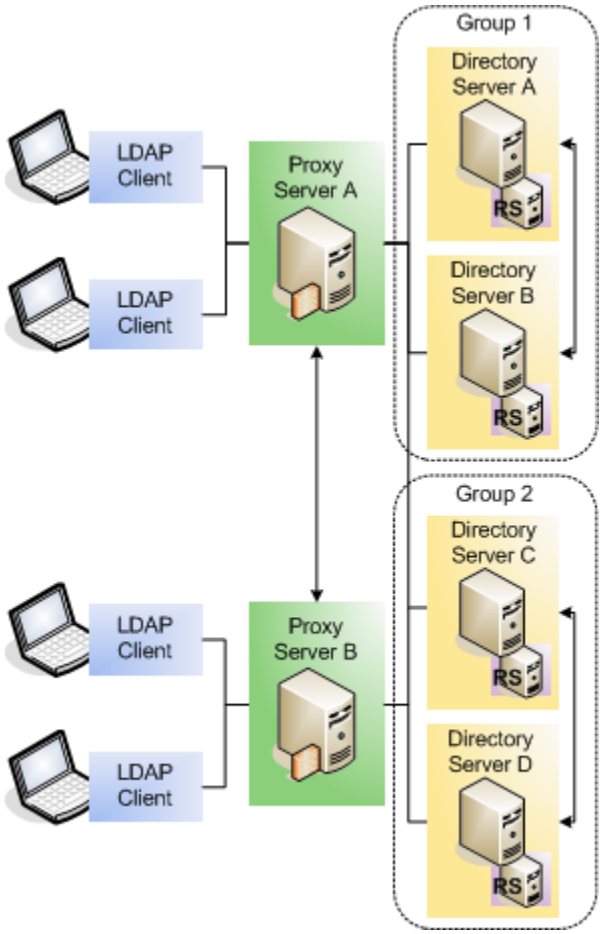
- The first topology assumes that the directory servers and replication servers (RS) are installed on the same host.
- The second topology assumes that the directory servers and replication servers are installed on separate hosts.

Group 1 and Group 2 in these diagrams refer to configured replication groups. For more information, see "Replication Groups" in the *Administration Guide for Oracle Unified Directory*.

6.4.1.1 Replication Server and Directory Server 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.

Figure 6–1 Replicated Topology With Proxy Servers - RS and DS on the Same Host



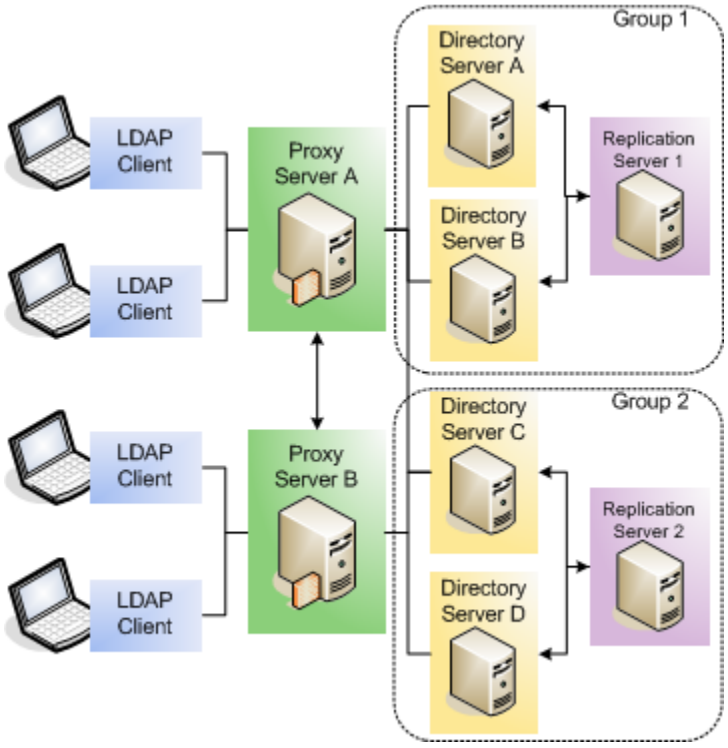
The update strategy in this topology would be as follows:

1. Change the configuration of proxy server A so that no requests are 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 6.5, "Updating an Existing Oracle Unified Directory 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 6.5, "Updating an Existing Oracle Unified Directory Instance".
10. Restart proxy server A.
11. Repeat steps 8-10 for the remaining proxy servers in the topology.

6.4.1.2 Replication Server and Directory Server on Separate Hosts

If the replication server and the directory server are installed on separate hosts, the servers are stopped and updated in the sequence described here.

Figure 6–2 Replicated Topology With Proxy Servers - RS and DS on Separate Hosts



The update strategy in this topology would be as follows:

1. Change the configuration of proxy server A so that no requests are routed to directory server A.
2. Stop directory server A.
3. Update directory server A, following the steps in Section 6.5, "Updating an Existing Oracle Unified Directory 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 6.5, "Updating an Existing Oracle Unified Directory 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 6.5, "Updating an Existing Oracle Unified Directory Instance".
13. Restart proxy server A.
14. Repeat steps 11-13 for the remaining proxy servers in the topology.

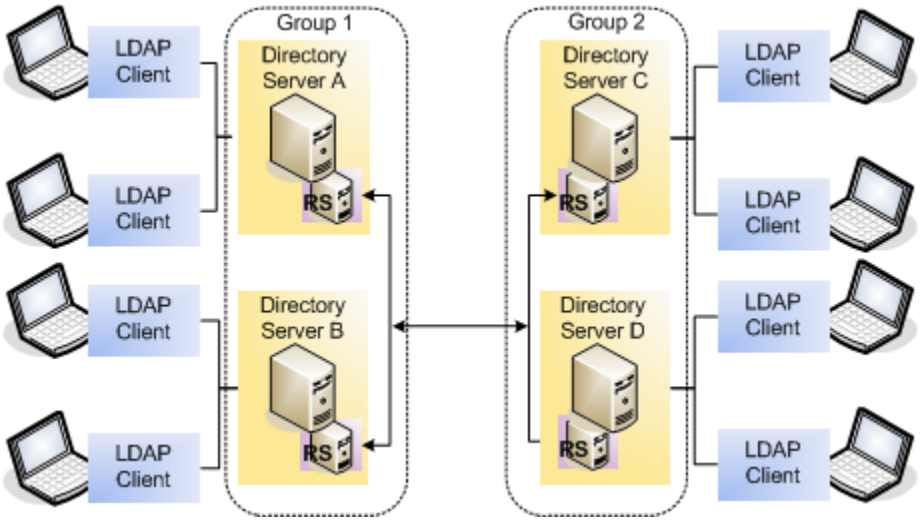
6.4.2 Upgrading in a Topology That Does Not Include a Proxy Server

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 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.

Group 1 and Group 2 in this diagram refer to configured replication groups. For more information, see "Replication Groups in the *Administration Guide for Oracle Unified Directory*.

Figure 6–3 Replicated Topology Without Proxy Servers



The update strategy in this topology would be as follows:

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 6.5, "Updating an Existing Oracle Unified Directory 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 6.5, "Updating an Existing Oracle Unified Directory Instance".
9. Follow steps 1-8 for each replication group in the topology.

6.5 Updating an Existing Oracle Unified Directory 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 installation, follow these steps:

1. Download the latest Oracle Unified Directory version from OTN or Oracle Software Delivery Cloud.

   For more information, see Section 2.1, "Obtaining the Software".

2. Stop any Oracle Unified Directory server instances that are associated with the `ORACLE_HOME` directory that you are upgrading.

   Unix

   ```
   $ instance-dir/OUD/bin/stop-ds
   ```

   Windows

   ```
   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 Installation Directories".

   The installer recognizes an existing installation and updates the relevant binary files. Do not recreate the server instances.

4. For Windows, you must 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 needs to be upgraded.

5. Upgrade any Oracle Unified Directory server instances that are associated with the `ORACLE_HOME` directory:

   Unix

   ```
   $ instance-dir/OUD/bin/start-ds --upgrade
   ```

   Windows

```
instance-dir\OUD\bat\start-ds.bat --upgrade
```

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.

   Unix

   ```
   $ instance-dir/OUD/bin/start-ds
   ```

   Windows

   ```
   instance-dir\OUD\bat\start-ds.bat
   ```

6.6 Updating Oracle Directory Services Manager

When you update the Oracle Unified Directory software, the Oracle Directory Services Manager (ODSM) binaries are also updated to version 11.1.2.2.0. Depending on your application server, perform the following:

- Updating Oracle Directory Services Manager on Oracle WebLogic Server
- Updating Oracle Directory Services Manager on IBM WebSphere

6.6.1 Updating Oracle Directory Services Manager on Oracle WebLogic Server

ODSM 11.1.2.2.0 is compatible with WebLogic Server 11*g* Release 1 (10.3.6), and with the Oracle Application Development Framework 11*g* Release 1 (11.1.1.7.0).

Note: You must restart the Oracle WebLogic Server after updating the Oracle Unified Directory software.

To upgrade Oracle WebLogic Server from 10.3.5 to 10.3.6, download the WebLogic Server 10.3.6 update installer and follow the steps in Section 2.3.1.1, "Installing Oracle WebLogic Server". You must stop all WebLogic domains before upgrading the WebLogic software. For more information, see the *Upgrade Guide for Oracle WebLogic Server*.

You must update your Oracle Application Development Framework to 11.1.1.7 for ODSM 11.1.2.2.0 to function correctly. To update Oracle Application Development Framework, from 11.1.1.5 or 11.1.1.6 to 11.1.1.7, download Oracle Application Development Framework and follow the steps in the *Oracle Fusion Middleware Installation Guide for Application Developer*. Note that, even if you have not upgraded the WebLogic software, you must stop the WebLogic domains before you upgrade the Application Development Framework. For more information about upgrading the Oracle Application Development Framework, see the *Upgrade Guide for Oracle SOA Suite, WebCenter, and ADF*.

6.6.2 Updating Oracle Directory Services Manager on IBM WebSphere

To update the Oracle Directory Services Manager on IBM WebSphere, perform the following steps:

Note: Before you update Oracle Directory Services Manager on IBM WebSphere, you must upgrade Oracle Unified Directory, as described in Section 6.5, "Updating an Existing Oracle Unified Directory Instance".

1. You must patch your existing Oracle Application Development Framework to 11*g* Release 1 (11.1.1.7.0), as described in "Applying the Latest Oracle Fusion Middleware Patch Set" in the *Oracle Fusion Middleware Patching Guide*.
2. Upgrade Oracle Platform Security Services, by running the following commands on the command line:

   On UNIX operating systems:

   ```
   $MW_HOME/oracle_common/common/bin/wsadmin.sh -username wasadmin -password
   wasadmin1
   Opss.upgradeOpss(jpsConfig="<was_install_location>/profiles/<application_server
   _profile_name>/config/cells/<cell_name>/fmwconfig/jps-config.xml",jaznData="<MW
   _Home>/oracle_common/modules/oracle.jps_11.1.1/domain_config/system-jazn-data.x
   ml")
   ```

   For example:

   ```
   Opss.upgradeOpss(jpsConfig="/disk01/IBM/WebSphere/AppServer/profiles/Custom01/c
   onfig/cells/Cell01/fmwconfig/jps-config.xml",jaznData="/Middleware/oracle_commo
   n/modules/oracle.jps_11.1.1/domain_config/system-jazn-data.xml")
   ```

3. Update the Oracle Application Development Framework on IBM WebSphere, by running the following commands:

   On UNIX operating systems:

   ```
   $MW_HOME/oracle_common/common/bin/wsadmin.sh -username wasadmin -password
   wasadmin1
   ADFAdmin.updateADFLibrary('<cell_name>','<node_name>','<server_name>')
   ```

   For example:

   ```
   ADFAdmin.updateADFLibrary('Cell01','Node01','OracleAdminServer')
   ```

4. Stop the node by using the following command on the command line:

   ```
   WAS_HOME/profiles/profile_name/bin/stopNode.sh
   ```

   For example, to stop the node on a UNIX operating system:

   ```
   /opt/IBM/WebSphere/AppServer/profiles/Custom01/bin/stopNode.sh
   ```

5. Stop the OracleAdminServer by using the following command on the command line:

   ```
   WAS_HOME/profiles/profile_name/bin/stopServer.sh OracleAdminServer
   ```

   For example, to stop the OracleAdminServer on a UNIX operating system:

   ```
   /opt/IBM/WebSphere/AppServer/profiles/Custom01/bin/stopServer.sh
   OracleAdminServer
   ```

6. Stop the deployment manager by using the following command on the command line:

   UNIX

```
WAS_HOME/profiles/deployment_mgr_profile_name/bin/stopManager.sh
```

Windows

```
WAS_HOME\profiles\deployment_mgr_profile_name\bin\stopManager.sh
```

For example, to stop the deployment manager on a UNIX operating system:

```
/opt/IBM/WebSphere/AppServer/profiles/Dmgr01/bin/stopManager.sh
```

7. Start the deployment manager by using the following command on the command line:

   UNIX

   ```
   WAS_HOME/profiles/deployment_mgr_profile_name/bin/startManager.sh
    -username admin_user -password admin_password
   ```

   Windows

   ```
   WAS_HOME\profiles\deployment_mgr_profile_name\bin\startManager.sh
    -username admin_user -password admin_password
   ```

   For example, to start the deployment manager on a UNIX operating system:

   ```
   /opt/IBM/WebSphere/AppServer/profiles/Dmgr01/bin/startManager.sh
   ```

8. Synchronize the node by using the following command on the command line:

   UNIX

   ```
   profiles/Server_profile_name/bin/syncNode.sh <host_name> <SOAP_Port> -username
   admin_user -password admin_password
   ```

   Windows

   ```
   profiles\Server_profile_name\bin\syncNode.sh <host_name> <SOAP_Port> -username
   admin_user -password admin_password
   ```

   For example:

   ```
   /disk01/IBM/WebSphere/AppServer/profiles/Custom01/bin/syncNode.sh
   myhost.mycompany.com 8879 -username wasadmin -password welcome1
   ```

9. Start the node by using the following command on the command line:

   ```
   WAS_HOME/profiles/profile_name/bin/startNode.sh
   ```

   For example, to stop the node on a UNIX operating system, enter:

   ```
   /opt/IBM/WebSphere/AppServer/profiles/Custom01/bin/startNode.sh
   ```

10. Start the OracleAdminServer by using the following command on the command line:

    ```
    WAS_HOME/profiles/profile_name/bin/startServer.sh OracleAdminServer
    ```

    For example, to start the OracleAdminServer on a UNIX operating system, enter:

    ```
    /opt/IBM/WebSphere/AppServer/profiles/Custom01/bin/startServer.sh
     OracleAdminServer
    ```

11. Update Oracle Directory Services Manager by using the following command on the command line:

On UNIX operating systems:

```
<MW_HOME>/oracle_common/common/bin/wsadmin.sh -conntype SOAP -port
<DMGR_SOAP_PORT> -username admin_user -password admin_password -f
<ORACLE_HOME>/odsm-tools/update_odsm_was.py -o <ORACLE_HOME>
```

For example:

```
$Middleware/oracle_common/common/bin/wsadmin.sh -conntype SOAP -port 8881
-username wasadmin -password welcome1 -f
/Oracle/Middleware/Oracle_OUD1/odsm-tools/update_odsm_was.py -o
/Oracle/Middleware/Oracle_OUD1
```

7

Configuring the JVM, Java Options, and Database Cache

The Oracle Unified Directory GUI installer or command-line installer provides you the option of automatically or manually tune the server, as described in Chapter 3, "Setting Up the Directory Server".

> **Note:** This option is not available when you install a proxy server instance or replication gateway instance.

This chapter describes the JVM, Java options, and database (DB) cache (or caches) manual tuning options.

This section covers the following topics:

- Section 7.1, "Configuring the Default JVM and Java Arguments"
- Section 7.2, "Configuring the Java Runtime Settings During Installation"
- Section 7.3, "Setting the Database Cache"

7.1 Configuring the Default JVM and Java Arguments

The directory server provides a means of configuring the Java Virtual Machine (JVM) and Java options for each command-line utility and for the directory server itself. The Java configuration is provided in a properties file, located at `instance-dir/OUD/config/java.properties` (Unix) or `instance-dir\OUD\config` (Windows). The configuration specified in this file is taken into account each time the `dsjavaproperties` command is run. If you do not run the `dsjavaproperties` command, the properties file is ignored.

The properties file can be used to specify (among other arguments) whether a command runs using the JVM in `-server` mode or `-client` mode. By default, all client applications run in `-client` mode, while the directory server and certain server utilities run in `-server` mode. Generally, `-server` mode provides higher throughput than `-client` mode, at the expense of slightly longer startup times.

For certain commands (`import-ldif`, `export-ldif`, `backup`, and `restore`) you can also specify different Java arguments (and a different JVM) depending on whether the command is run in online or offline mode.

7.1.1 The Java Properties File Format

The Java properties file has the following format.

- `command-name.java-home=JVM-path`
- `command-name.java-args=JVM-arguments`

The following table shows three properties present in the `java.properties` file that are of particular importance.

Property	Description
`overwrite-env-java-args`	If `True`, the system checks the `default.java-args` property in this properties file before the 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 for all of its command-line utilities, unless a different JVM is specified for a particular utility.

7.1.2 Configuring JVM Options

The following table summarizes the Java options that can have an impact on server performance. Note that some of these options apply only to the Sun JVM.

Condition	Option	Description
	`-server`	Selects server application runtime optimizations. The directory server will take longer to start and "warm up" but will be more aggressively 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. This options should be specified when a large JVM heap is required (greater than 4 Gbytes) and the architecture is 64-bit.

Condition	Option	Description
	`-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, take a look at 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 DB 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 runtime. 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 DB 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, you should consider using this option in order 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.
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.

Condition	Option	Description
	`-XX:CMSInitiatingOccupancyFraction=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.

7.1.3 To Specify the JAVA_HOME Environment Variable for a Specific Utility

1. Edit the Java properties file as follows: `command-name.java-home=jvm`.

   For example, to specify a particular JDK 1.6 for the offline import, edit the line that starts with `import-ldif.offline` in the `java.properties` file, as follows: `import-ldif.offline.java-home=/usr/jdk1.6`.

2. Run the `dsjavaproperties` command to apply the property.

7.1.4 To Specify the Java Arguments for a Specific Utility

1. Edit the Java properties file as follows: `command-name.java-args=arguments`.

   For example, to specify that a maximum heap size of 256 Mbytes be used for the online export, edit the line that starts with `export-ldif.online` in the `java.properties` file, as follows: `export-ldif.online.java-args=-Xms256m -Xmx256m`.

2. Run the `dsjavaproperties` command to apply the property.

7.2 Configuring the Java Runtime Settings During Installation

If you use the GUI installer, you can configure Java runtime settings as part of the install process, as described in Section 3.1, "Setting up the Directory Server by Using the GUI". To configure Java runtime settings, click **Change** on the **Providing Runtime Options** Screen. The following settings can be configured:

- **Initial Memory.** Specifies the amount of memory, in Megabytes, that will be used to start the server.
- **Maximum Memory.** Specifies the maximum amount of memory, in Megabytes, that will be dedicated to running the server.

- **Other Java Arguments.** Any other Java options that might have an impact on server performance. For a detailed list of these options, see Configuring JVM Options.

> **Note:** You can also specify the Java settings for the import task when you install a directory server by using the `oud-setup` command, as described in Section 3.2, "Setting Up the Directory Server by Using the CLI". This option is not available when you install a proxy server.

7.3 Setting the Database Cache

A critical component of your directory server's overall performance is the size of the database (DB) cache. You need to determine your particular memory settings depending on your hardware, the number of entries in your directory, and your performance requirements. For example, when importing data by using the `import-ldif` utility, you must configure the directory server in such a way to minimize and avoid potential data cache eviction problems. Ideally, you should set the DB cache to a value that ensures that the whole database can fit into the cache. The size of the required heap depends on the number of entries and their size. For example, if you were importing 200K entries of 10Kbytes each, you might specify 2 Gbytes for the JVM heap size, then allocate at least 1 Gbyte for the directory server runtime environment and the rest for the DB cache.

7.3.1 To Set the Database Cache

You can set the DB cache by configuring the `db-cache-percent` or the `db-cache-size` properties with the `dsconfig` command-line utility. The `db-cache-percent` and the `db-cache-size` properties represent the maximum size that the server can use for the DB 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:** If you want to set the `db-cache-percent` property, then the `db-cache-size` property must be kept at the default value of 0 Mbytes. The `db-cache-size` property has precedence over the `db-cache-percent` property if both are given values.

1. Change to the appropriate directory.

```
(UNIX, Linux)  $ cd instance-dir/OUD/bin
(Windows)      C:\> cd instance-dir\OUD\bat
```

2. Run the `dsconfig` command to set the `db-cache-percent`, as follows:.

```
dsconfig set-workflow-element-prop --element-name userRoot --set
db-cache-percent:50 --hostname <hostname> --port <portnumber> -X -D
@ "cn=directory manager"-j /tmp/password -n
```

This sets the `db-cache-percent` to 50 percent. Thus, for a 2 Gbyte memory allocation, 1 Gbyte of memory will be allocated to the DB cache and the rest to the JVM.

8

Managing Oracle Unified Directory as a Windows Service

This chapter covers the following topics:

- Section 8.1, "Managing the Server as a Windows Service"
- Section 8.2, "Removing the Oracle Unified Directory Windows Service"

8.1 Managing the Server as a Windows Service

Use the `windows-service` command to enable or disable the 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, see windows-service in the *Oracle Fusion Middleware Administrator's Guide for Oracle Unified Directory*.

Note: You can also specify that the server should be run as a Windows service during installation time, if you use the GUI install. On the Review panel, at the end of the installation, select Run the server as a Windows Service.

8.1.1 Configuring the Timeout Value When the 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:

- Use the `window-service.bat` utility to clean up the existing service.
- Manually remove the Windows service in the Windows registry.

8.2.1 To Remove a Windows Service by 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 To Remove 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 on its Processes tab, and make sure 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 up successfully, thus confirming that the current configuration is valid.

5. Delete the instance directory to make sure that you have completely uninstalled Oracle Unified Directory.
6. Restart Windows.

   The Windows service should be removed.

9 Deinstalling Oracle Unified Directory

There are two steps to deinstalling Oracle Unified Directory from your system:

- Deinstall the server instances that you have configured
- Remove the software itself from the system

This chapter provides instructions for both steps. You must deinstall the server instances before you deinstall the software.

This chapter contains the following topics:

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 uninstall in the *Oracle Fusion Middleware Administrator's Guide for Oracle Unified Directory*.

9.1.1 Deinstalling a Directory Server Instance

You can deinstall a directory server instance by using the graphical user interface, or the command line.

9.1.1.1 To Deinstall a Directory Server Instance in 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:

```
(UNIX, Linux) $ instance-dir/OUD/uninstall
(Windows)     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 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 To Deinstall a Directory Server Instance by 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:

   ```
   (UNIX, Linux) $ instance-dir/OUD/uninstall --cli
   (Windows)     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 stand-alone 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. If you want to quit the uninstaller without removing files, type `q`.

   The uninstall quits the process and logs the entry.

   UNIX 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 To Deinstall a Directory Server Instance by 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 by using the graphical user interface, or the command line.

9.1.2.1 To Deinstall a Proxy Server Instance in GUI Mode

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:

   ```
   (UNIX, Linux) $ instance-dir/OUD/uninstall
   (Windows)     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 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 To Deinstall 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:

   ```
   (UNIX, Linux) $ instance-dir/OUD/uninstall --cli
   (Windows)     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. If you want to quit the uninstaller without removing files, type `q`.

   The uninstall quits the process and logs the entry.

   UNIX 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 To Deinstall a Proxy Server Instance by 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:

- Section 9.1.3.1, "To Deinstall a Replication Gateway Instance in GUI Mode"
- Section 9.1.3.2, "To Deinstall a Replication Gateway Instance Using the CLI"
- Section 9.1.3.3, "To Deinstall a Replication Gateway Instance by Using a Script"

> **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 To Deinstall a Replication Gateway Instance in GUI Mode

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:

   ```
   (UNIX, Linux) $ instance-dir/OUD/uninstall
   (Windows)     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 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 To Deinstall 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:

```
(UNIX, Linux)
$ instance-dir/OUD/uninstall --cli -h server1.example.com \
  --adminUID admin --adminPasswordFile pwd-filename \
  --bindDNLegacy "cn=Directory Manager" --bindPasswordFileLegacy pwd-filename \
  --dsccPasswordFileLegacy pwd-file

(Windows)
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 To Deinstall a Replication Gateway Instance by 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 Deinstalling 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.

   ```
   $ cd $ORACLE_HOME/oui/bin
   ```

   On Windows systems, change to the `$ORACLE_HOME\oui\bat` directory.

2. Run the Oracle Universal Installer with the `-deinstall` option.

   ```
   $ ./runInstaller -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 is displayed, that indicates the directories that will be uninstalled. Click Yes to proceed with the deinstallation.
6. On the Deinstallation Complete screen, click **Finish**.
7. The `ORACLE_HOME` directory and all of its contents are removed.