Oracle® Fusion Middleware

Installation Guide for Oracle Unified Directory

11*g* Release 2 (11.1.2)

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

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Primary Author: Lana Frost

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.

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Related Documents

You might want to refer to the following documentation:

- *Oracle Fusion Middleware Administrator's Guide for Oracle Unified Directory 11g Release 1 (11.1.1)*

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.
italic	Italic type indicates book titles, emphasis, or placeholder variables for which you supply particular values.

Convention	Meaning
`monospace`	Monospace type indicates commands within a paragraph, URLs, code in examples, text that appears on the screen, or text that you enter.

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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 you start the installation procedure, read the system requirements and certification documentation to ensure that your environment meets the minimum installation requirements for the components you are installing. Both of these documents are available on Oracle Technology Network (OTN).

The system requirements document covers information such as 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-requirements-100147.html`

The system requirements document also covers Oracle Universal Installer Startup Requirements.

The certification document covers supported installation types, platforms, operating systems, databases, JDKs, and third-party products:

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

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. 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. 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**.

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:

- `install-dir`

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

- `MIDDLEWARE-HOME`

  This is the directory into which Oracle Unified Directory, WebLogic Server, and the 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).

  The `MIDDLEWARE-HOME` directory and the `OUD Base Location Home` (defined during the Oracle Unified Directory installation) are the same directory.

  The `MIDDLEWARE-HOME` directory ultimately contains the following main product directories:

  - OUD_ORACLE_HOME

    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`.

    The default `OUD_ORACLE_HOME` directory is `Oracle_OUD1`.

  - `wlserver_10.3`

    Contains Web Logic Server.

  - `oracle_common`

    Contains the Application Development Framework.

  - `coherence_3.6`

    Contains the Oracle Coherence data grid software, if you have elected to install this alongside Web Logic Server.

A complete breakdown of the directory contents after installation is provided below:

```
install-dir
                    MIDDLEWARE-HOME
                        coherence_3.6
```

```
domain-registry.xml
logs
modules
ocm.rsp
Oracle_OUD1
oracle_common
registry.dat
registry.xml
user_projects
utils
wlserver_10.3
```

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 Oracle WebLogic 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, 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 and the Oracle Application Development Framework.

> **Note:** The version of ODSM described in this document is 11.1.2.0.0. ODSM 11.1.2.0.0 can be used to manage Oracle Unified Directory *only*. It cannot be used with Oracle Internet Directory or Oracle Virtual Directory. Versions of ODSM prior to 11.1.1.5.0 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 Getting the Oracle Unified Directory Software

You can obtain Oracle Unified Directory, Oracle WebLogic Server, and the Oracle Application Development Framework by using one of the following methods:

- Oracle Technology Network (OTN) (`http://www.oracle.com/technetwork/index.html`)
- Oracle Software Delivery Cloud (`https://edelivery.oracle.com`)

The ODSM software is installed when you install Oracle Unified Directory.

2.2 Installing Oracle Unified Directory

1. Download the Oracle Unified Directory zip file (`oud.zip`) from OTN or Oracle Software Delivery Cloud.
2. Unzip the Oracle Unified Directory zip file:

   ```
   $ cd download-path
   $ unzip oud.zip
   ```

3. Change to the Disk1 directory.

   ```
   $ 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).

   On UNIX systems:

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

   For example:

   ```
   $ ./runInstaller -jreLoc /usr/lang/JAVA/jre1.6.0_20
   ```

   On Windows systems:

   ```
   C:\download-path\oud\Disk1>setup.exe -jreLoc JAVA_HOME
   ```

   For example:

   ```
   C:\oud\Disk1>setup.exe -jreLoc C:\Progra~1\Java\jre1.6.0_20
   ```

   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 Linux 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.

7. On the Install Software Updates screen, select Skip Software Updates and click Next.

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.

9. On the Specify Installation Location screen, provide the following locations:

- **OUD Base Location Home.** This directory will house any Oracle Unified Directory instances that are configured at a later stage, unless you specify an alternate instance directory path.
- **Oracle Home Directory.** The Installer uses the name you enter in this field to create the Oracle Home directory under the 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.

10. Verify the installation and configuration information on the Installation Summary screen.

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. On the Installation Progress screen, click Next.
12. On the Installation Complete screen, 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`, and click Save.
3. When the response file has been saved, cancel the installation.
4. Run the following command to perform the silent installation:

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

2.3 Installing Oracle WebLogic Server

If you plan to manage Oracle Unified Directory with ODSM, you must install Oracle WebLogic Server, as described in this section. For complete installation information, see the Oracle Fusion Middleware Installation Guide for Oracle WebLogic Server (http://download.oracle.com/docs/cd/E15523_01/doc.1111/e14142/toc.htm).

> **Note:** You must install Oracle WebLogic Server as the same user who installed Oracle Unified Directory.

1. Insert the Oracle WebLogic Server CD-ROM or download the Oracle WebLogic Server Installer from the following Web site:

   http://www.oracle.com/technetwork/middleware/downloads/index-087510.html

   Oracle Unified Directory 11.1.2 supports Oracle WebLogic Server Installer versions 10.3.5 and 10.3.6.

2. Locate the appropriate executable file for your system, for example:

- `wls1036_linux32.bin` for 32-bit Linux systems
- `wls1036_win32.exe` for 32-bit Windows systems
- `wls1036_generic.jar` for all 64-bit platforms

The 32-bit executable files are bundled with the appropriate JDK version. If you use the 64-bit installer, you will need to invoke the installer with a supported JDK for your platform. This JDK must be installed on your system before you install Oracle WebLogic Server. Refer to the Oracle Fusion Middleware certification document (http://www.oracle.com/technology/software/products/ias/files/fusion_certification.htm) for a list of supported JDKs for your platform

3. Run the Oracle WebLogic Server Installer directly from the CD-ROM, or copy the file to your local system and run it locally. For 64-bit installations:

   - Replace `JAVA_HOME` with the installation location of the supported JDK you installed for your platform.
   - Use the `-d64` flag when using 32/64-bit hybrid JDKs (such as the HP JDK for HP-UX and SUN JDK for Solaris SPARC).
   - Execute `JAVA_HOME/bin/java -version` (or `JAVA_HOME/bin/java -d64 -version` on 32/64-bit hybrid JDKs) to ensure that your `JAVA_HOME` refers to a 64-bit JDK.

   Examples for 32-bit systems:

   Linux:

   ```
   ./wls1036_linux32.bin
   ```

   Windows:

   ```
   wls1036_win32.exe
   ```

   Examples for 64-bit systems:

   UNIX:

   ```
   JAVA_HOME/bin/java -jar wls1036_generic.jar
   ```

   or

   ```
   JAVA_HOME/bin/java -d64 -jar wls1036_generic.jar
   ```

   Windows:

   ```
   JAVA_HOME\bin\java -jar wls1036_generic.jar
   ```

   After you start the Oracle WebLogic Server Installer, the Welcome screen is displayed.

   Click Next.

4. On the Choose Middleware Home Directory screen, appears select Create a new Middleware Home.

   The Middleware Home directory *must* be the same directory as the OUD Base Location Home that you defined when you installed Oracle Unified Directory (see Step 7 of the previous procedure). If these directories are not the same, ODSM will not work correctly.

   Click Browse to navigate to the OUD Base Location Home directory, then click Next.

A message is displayed, indicating that the directory is not empty. Click Yes to proceed with the installation.

5. On the Register for Security Updates screen, select whether or not you want to receive the latest product and security updates. If you choose not to receive updates, you are asked to verify your selection before continuing.

   Click Next.

6. On the Choose Install Type screen, select Typical and click Next.

7. On the JDK Selection screen, select a valid JDK.

8. On the Choose Product Installation Directories screen, verify the location for the WebLogic Server Installation and click Next.

9. If you are installing Oracle WebLogic Server on a UNIX system, the Installation Summary screen is displayed. Proceed to step 10.

   If you are installing Oracle WebLogic Server on a Windows system, the Choose Shortcut Location screen appears. Specify a location where you want Windows to create a shortcut to Oracle products and click Next.

10. Click Next on the Installation Summary screen.

11. On the Installation Complete screen, de-select Run Quickstart and click Done to exit the Installer.

2.4 Installing the Oracle Application Development Framework

ODSM is a J2EE application that runs inside a Web Logic 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.

---

1. 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

   Oracle Unified Directory 11.1.2 supports Oracle Application Development Framework 11.1.1.6.0.

   The Oracle Application Development Framework Runtime 11.1.2.1.0 is provided as a patch for Oracle Application Development Framework Runtime 11.1.1.5 and is available through Oracle Support.

2. Unzip the Oracle Application Development Framework zip file:

   ```
   $ cd download-path
   $ unzip ofm_appdev_generic_11.1.1.6.0_disk1_1of1.zip
   ```

3. Change to the Disk1 directory.

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

4. Start the Oracle Universal Installer by running the `runInstaller` script, specifying the location of a valid Java installation.

   On UNIX systems:

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

   On Windows systems:

   ```
   DRIVE:\setup.exe -jreLoc JAVA_HOME
   ```

5. If this is the first time an Oracle product is being installed on the system, specify the inventory directory.
6. On the Welcome screen, click Next.
7. On the Install Software Updates screen, select Skip Software Updates and click Next.
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.
9. On the Specify Installation Location screen, provide the following locations:
   - **Oracle Middleware Home.** This directory must be the same as the OUD Base Location Home that you specified during the Oracle Unified Directory installation.
   - **Oracle Home Directory.** The Oracle Home directory is created under the 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`.
10. On the Application Server screen, WebLogic Server should be selected by default. Click Next.
11. Verify the installation and configuration information on the Installation Summary screen.

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

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

    Click Install. The Installation Progress screen is displayed.
12. On the Installation Progress screen, click Next.
13. On the Installation Complete screen, check the details of the installation and click Finish.

2.5 Configuring WebLogic Server for Oracle Directory Services Manager

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:

   ```
   $ OUD Base Location Home/oracle_common/common/bin/config.sh
   ```

   On Windows systems, run the comparable `config.bat` script.
2. On the Welcome screen, select Create a new WebLogic domain and click Next.
3. On the Select Domain Source screen, select the Oracle Directory Services Manager check box.

   Oracle JRF is selected automatically.
4. Click Next.
5. On the Specify Domain Name and Location screen, 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.
6. On the Configure Administrator User Name and Password screen, type 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.
7. On the Configure Server Start Mode screen, select Production Mode.

   Select a valid JDK and click Next.
8. On the Optional Configuration screen, click Next.
9. On the Configuration Summary screen, verify the domain details and click Create.
10. On the Creating Domain Screen, click Done.

2.6 Accessing Oracle Directory Services Manager

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 5 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 ODSM port.

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 panel, click Next.
5. On the Server Settings panel, enter the following information:
   a. *Host Name.* Enter the directory server's host name or IP address.

      The default is the local host name.

   b. *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.

   c. *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*.

   d. *LDAP Secure Access.* If you want to configure SSL, StartTLS, or both, 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. Click 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 to continue.

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

f. *Password.* Enter the root user bind password.

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

h. Click Next to continue.

6. On the Topology Options panel, select one of the following:

   a. This will be a stand-alone server.

   b. 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".

7. Click Next to Continue.

8. On the Directory Data panel, specify how to load data into your directory:

   a. *Directory Base DN.* Enter the base DN for your directory.

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

   b. 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.

9. On the Oracle Components Integration panel, select **one** of the following:

   - **Enable for EUS** 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 (see Step 5 d of 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
     ```

   - **Enable for Fusion Applications** if you want this server to be used as an identity store for Oracle Fusion Applications.

When you enable a server instance for Oracle Fusion Applications, a workflow element named `Fa0` (`cn=Fa0,cn=Workflow elements,cn=config`) is created and enabled.

10. Click Next to continue.
11. 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 Section 7.2, "Configuring the Java Runtime Settings During Installation".
12. On the Review panel, 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.
13. Click Finish.
14. Click Close.
15. 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

15. Type yes if you want this server to be used as an identity store for Oracle Fusion Applications.

    When you enable a server instance for Oracle Fusion Applications, a workflow element named Fa0 (cn=Fa0,cn=Workflow elements,cn=config) is created and enabled.

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

17. 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.

18. 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=*)"
    ```

3.3 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:

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

    b. 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.

    c. Select Configure as Secure if you want to use encrypted communication when connecting to the replication port on the first server.

Record 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:
   a. Select This server will be part of a replication topology.
   b. 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.
   c. Select There is already a server in the topology.
      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 these 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 *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*.

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

      The default is the local host name.

   b. *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.

   c. *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.

   d. *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*.

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

   f. *Password.* Enter the root user bind password.

   g. *Password (confirm):* Re-enter the root user bind password.

   h. Click Next to continue.
6. In the Deployment Options panel, 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 to continue.
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.

   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 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.

   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 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.

   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.

8. Click Next.

9. 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*.

10. 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 `1` 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.

11. 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`.

12. 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.

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*.

4.1.3 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 panel, enter the following information:
   a. *Host Name.* Enter the proxy server's host name or IP address.

      The default is the local host name.

   b. *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.

   c. *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 to continue.

   d. *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*.

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

   f. *Password.* Enter the root user bind password.

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

   h. Click Next to continue.

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:

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.

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:

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

      The default is the local host name.

   b. *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.

   c. *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 to continue.

d. *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*.

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

f. *Password.* Enter the root user bind password.

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

h. Click Next to continue.

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.

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*.

a. 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.

b. 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`.

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.

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.

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*.

4.2 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
   ```

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 panel, 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*.

5. On the Replication Gateway Administration panel, enter the following information:

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

      The default is the local host name.

b. *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*.

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

d. *Password.* Enter the root user bind password.

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

f. Click Next to continue.

6. On the ODSEE Server Settings panel, enter the following information:

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

      The default is the local host name.

   b. *Port.* Enter the LDAP port for the ODSEE directory server.

   c. *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`.

   d. *Password.* Enter the bind password.

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

   f. 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 specified in step b 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.

   g. Click Next to continue.

7. Review the ODSEE replication setup and click Next.

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

9. Click Next to continue.

10. On the Oracle Unified Directory Server Settings panel, enter the following information:

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

       The default is the local host name.

    b. *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*.

c. *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.

d. Enter the password of the Global Administrator.

e. Click Next to continue.

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.
14. On the Replicated Base DNs screen, 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 11.1.2.0
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" --bindPasswordLegacyFile pwd-file \
  --hostNameNg OUD-host --portNg 4444 --adminUID admin \
  --adminPasswordFile pwd-file --trustAll --no-prompt --noPropertiesFile
```

For detailed information about all of the command-line options, see "oud-replication-gateway-setup" *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

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:

- Section 6.1, "Updating a Directory Service Without Service Interruption"
- Section 6.2, "Updating an Existing Oracle Unified Directory Instance"
- Section 6.3, "Updating the Oracle Directory Services Manager Software"

6.1 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 6.1.1, "Upgrading in a Topology That Includes a Proxy Server"
- Section 6.1.2, "Upgrading in a Topology That Does Not Include a Proxy Server"

6.1.1 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:

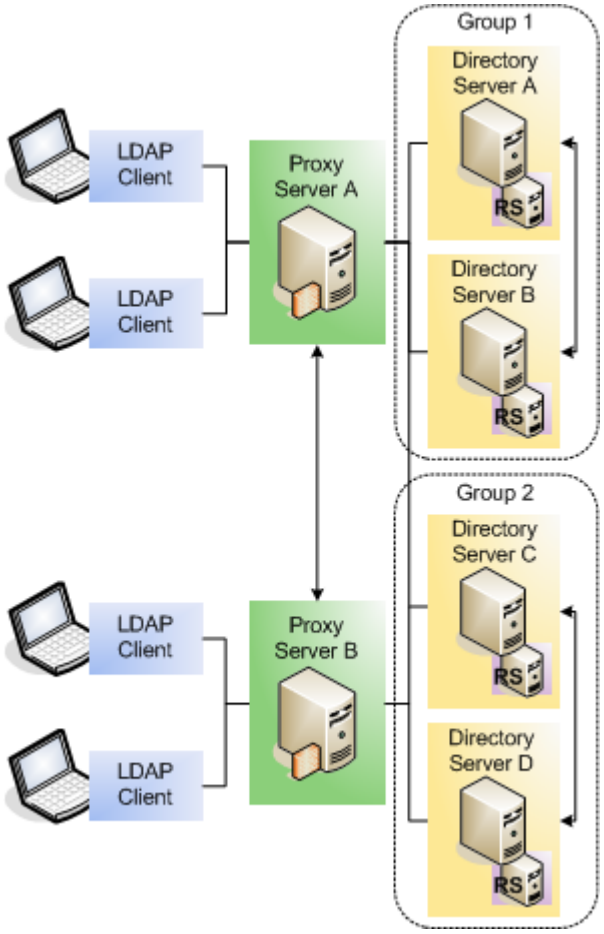
- The first topology assumes that the directory servers and replication servers (RS) are installed on the same host.
- The second topology assumes that the directory servers and replication servers are installed on separate hosts.

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*.

6.1.1.1 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:

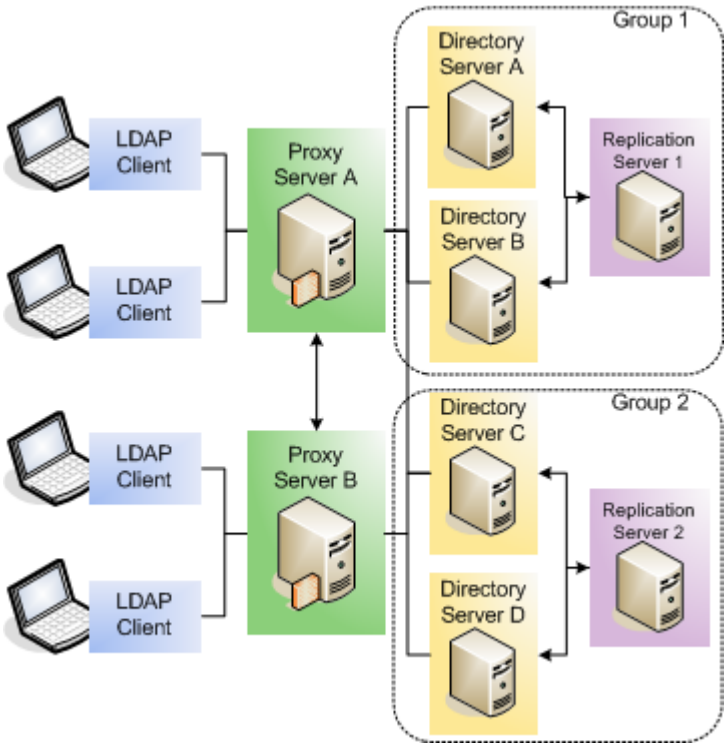
1. Change the configuration of proxy server A so that no requests are routed to directory server A.

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 6.2, "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 6.2, "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.

6.1.1.2 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 6.2, "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 6.2, "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 6.2, "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.

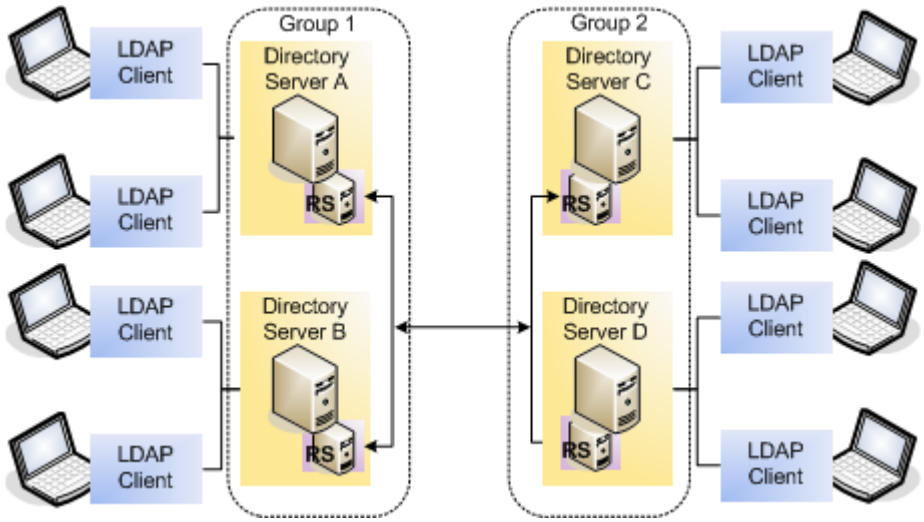
6.1.2 Upgrading in a Topology That Does Not Include a Proxy Server

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 separate hosts. 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 must be stopped and updated at the same time.

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 6.2, "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 6.2, "Updating an Existing Oracle Unified Directory Instance".
9. Follow steps 1-8 for each replication group in the topology.

6.2 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, "Getting the Oracle Unified Directory Software".

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

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

   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. Restart the server instances that you stopped in Step 1.

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

   During the restart, the server configuration is updated to be aligned with the new Oracle Unified Directory version.

6.3 Updating the Oracle Directory Services Manager Software

When you update the Oracle Unified Directory software, the Oracle Directory Services Manager (ODSM) binaries are also updated to version 11.1.2.

ODSM 11.1.2 is compatible with Oracle WebLogic Server 10.3.5 or 10.3.6, and with the Oracle Application Development Framework 11.1.1.6.

Upgrading your Oracle WebLogic Server installation is optional. To update 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, "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 11.1.1.6 for ODSM 11.1.2 to function correctly. To update Oracle Application Development Framework, from 11.1.1.5 to 11.1.1.6, download Oracle Application Development Framework and follow the steps in Section 2.4, "Installing the Oracle Application Development Framework". 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*.

7

Configuring the JVM, Java Options, and Database Cache

Oracle Unified Directory and its command-line utilities run with a default Java Virtual Machine and with default Java arguments. To improve performance for your specific directory deployment, it might be useful to configure the JVM, Java options, and database (DB) cache (or caches).

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`. 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. To configure Java runtime settings, click Change on the Runtime Options panel. 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. 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. Use the `dsconfig` command to set the `db-cache-percent`.

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

```
$ dsconfig -h localhost -port 4444 -D "cn=Directory Manager" -j pwd-file -X \
  -n set-backend-prop --backend-name userRoot --set db-cache-percent:50
```

8

Managing Oracle Unified Directory as a Windows Service

This section 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 *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 Uninstalling Oracle Unified Directory

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

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

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

This chapter contains the following topics:

9.1 Uninstalling an Oracle Unified Directory Instance

The following procedures describe how to uninstall 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 *Oracle Fusion Middleware Administrator's Guide for Oracle Unified Directory*.

9.1.1 Uninstalling a Directory Server Instance

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

9.1.1.1 To Uninstall a Directory Server Instance in GUI Mode

GUI mode is the default and recommended uninstall option. The GUI provides an easy interface for removing a directory 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 part of a replication topology, click **Yes** to continue the uninstallation.

   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 uninstall.

   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 Uninstall 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 Uninstall 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 Uninstalling 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 Uninstall a Proxy Server Instance in GUI Mode

GUI mode is the default and recommended uninstall 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 Uninstall a Proxy Server Instance by 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 Uninstall 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 Uninstalling a Replication Gateway Instance

You can uninstall 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 Uninstall a Replication Gateway Instance in GUI Mode"
- Section 9.1.3.2, "To Uninstall a Replication Gateway Instance by Using the CLI"
- Section 9.1.3.3, "To Uninstall 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 Uninstall a Replication Gateway Instance in GUI Mode

GUI mode is the default and recommended uninstall 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 bind DN and password of the user configured to connect to the ODSEE server.

   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 Uninstall a Replication Gateway Instance by 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 uninstall, 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

(Windows)
C:\> instance-dir\OUD\uninstall.bat --cli -h server1.example.com \
  --adminUID admin --adminPasswordFile pwd-filename \
  --bindDNLegacy "cn=Directory Manager" --bindPasswordFileLegacy pwd-filename
```

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 Uninstall 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 uninstallation 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 \
--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 Uninstalling 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 uninstall.
5. A Warning screen is displayed, that indicates the directories that will be uninstalled. Click Yes to proceed with the uninstallation.
6. On the Deinstallation Complete screen, click Finish.
7. The `ORACLE_HOME` directory and all of its contents are removed.