Sun OpenDS Standard Edition 2.2 Installation Guide

Sun microsystems

Contents

Which Install To Choose

Sun OpenDS Standard Edition can function in one of two modes:

- As an LDAP **directory server**, used to contain data.
- As a **proxy server**, where the server acts as an interface between the client and the directory server that contains the data.

The following sections give you guidance on which Sun OpenDS Standard Edition installation you should use.

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

About the Directory Server

Install the Sun OpenDS Standard Edition directory server if you want to create a LDAP directory server, containing directory data. To do so, see the procedure in "Installing the Directory Server" on page 17.

About the Proxy Server

When installing Sun OpenDS Standard Edition as a 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 Sun OpenDS Standard Edition in proxy mode, see the procedure in "Installing the Proxy Server" on page 25.

When using the Sun OpenDS Standard Edition 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 Sun OpenDS Standard Edition directory server or Sun Directory Server Enterprise Edition 7.0.

Sun OpenDS Standard Edition System Requirements

To ensure good server performance, your system must meet the following requirements:

Hardware Requirements

For optimal performance, your system must have sufficient RAM memory for the JVM heap and database cache. For more information on setting the JVM heap and database cache, see "Configuring the JVM, Java Options, and Database Cache" on page 43.

On Solaris systems, the operating system should be configured to have at least twice as much virtual memory as JVM heap. To achieve this, you might need to increase the size of the operating system swap space.

Your system should also have enough disk space to store the generated log files. The server log files can consume up to 1 Gbyte of disk space with default server settings. In replicated environments, the change log database can grow up to 30-40 Gbytes with loads of 1000 mods/sec. For information on setting log file size, see "Managing Administration Traffic to the Server" in *Sun OpenDS Standard Edition 2.2 Administration Guide*.

You can configure Sun OpenDS Standard Edition in such a way that it uses substantially less, or more, disk space depending on your application and performance needs. Any setup considerations must determine the amount of memory for the server's database and log files.

As a general guideline, the following hardware is recommended:

Hardware Component	Requirement
RAM	**Evaluation purposes:** At least 256 Mbytes of free memory for a small database.
	Production: Minimum of 2 Gbytes.
	If you are using a global index catalog, you might need more memory. Typically, you should have 20 Gbytes of RAM for every 100,000,000 entries that are stored in the global index catalog.
	Note – For large databases or large global index catalogs that require more than 4 Gbytes of RAM, your system should use 64–bit architectures.
Local disk space	**Evaluation purposes:** For a small database and sufficient space for log files, your system should have at least 100 Mbytes of free local disk space. Preferably, you should have at least 1 Gbyte of disk space.
	Production: For a typical production deployment with a maximum of 250,000 entries and no binary attributes, such as images, 4 Gbytes of disk space might be sufficient for the database only. You might need an additional 1 Gbyte of disk space for log files. You need to determine disk space for the change log database (DB), which is dependent on the load (updates per second) and on the replication purge delay (that is, the time the server should keep information about internal updates). The change log DB can grow up to 30-40 Gbytes with loads of 1000 modifications per second.
	When you use global index replication, ensure that you have enough disk space for the replication change logs. By default, the change log stores changes from the last 24 hours. The configuration should be based on the expected size of the service. For example, you would need 150 Gbytes for 5000 modify/seconds.
	Note – The directory server does not support databases and logs installed on NFS-mounted file systems. Sufficient space should be provided for the database on a local file system, for example, in `/var/opt` or `/local` on UNIX or Linux machines.

Supported Operating Systems

Sun OpenDS Standard Edition 2.2 is supported on the following systems.

TABLE 1   Tested Operating Systems

Operating System	Description
Solaris^{TM} 10	SPARC® 64–bit, x86 and x64 architectures
OpenSolaris^{TM} 2009.06	SPARC, x86 and x64 architectures
Microsoft Windows 2003 Server	for x86
Microsoft Windows 2008 Server	for x86 and x64 architectures

TABLE 1 Tested Operating Systems *(Continued)*

Operating System	Description
Red Hat Linux Advanced Server 5.3	for x86 and x64 architectures
SuSE Linux Enterprise Server 10	for x86 and x64 architectures
Ubuntu Linux 8.04	for x86 and x64 architectures

Note – x64 refers to both Intel 64 and AMD 64.

For Sun OpenDS Standard Edition proxy, only x86 is supported for Microsoft Windows 2008 Server.

Operating System Requirements

The following table outlines the operating system requirements.

Item	Requirement
Operating System TCP/IP Ports	The directory server uses the following ports by default: ■ Administration connector, default port 4444 ■ LDAP, default port 389 ■ LDAPS, default port 636 ■ SNMP, default port 161 if configured ■ JMX, default port 1689 ■ Replication port 8989 **Note –** The ports can differ between root and non-root users for some protocols.
File Descriptor Limits	On some Linux systems, the default file descriptor limit is set to 1024. This value might be too small when processing the total number of client connections, database files, and log files that the directory server requires to operate. It is strongly recommended that this file descriptor limit be increased to 64K or (65536 field descriptors).

Java Requirements

The directory server requires that your system have an installed version of at least Java SE 5.0 (Sun version 1.5.0_08) Java runtime environment (JRE). The preferred JRE is the latest version of Java SE 6.0. Java SE runtime environments for Solaris, Linux, and Windows systems are available online at the following web site: http://java.sun.com/javase/downloads/index.jsp.

Java Runtime Environment   Tested up to Version:

Sun JRE 1.5.0_20 (32-bit and 64-bit)

Sun JRE 1.6.0_16 (32-bit and 64-bit)

(performs better on the latest revision of Sun Java 6.0)

Java Environment Variables

You must provide the directory server with information about the location of the Java installation that should be used by setting the OPENDS_JAVA_HOME environment variable. A potential problem could arise if the OPENDS_JAVA_HOME environment variable is not set, or does not point to the root of a valid (at least Java 5.0, JRE 1.5.0_08) installation. Alternatively, using the OPENDS_JAVA_BIN variable to point to the absolute path of the Java executable may be helpful if you want to use a 64-bit JVM rather than the default 32-bit version (for example, $JAVA/bin/sparcv9/java or $JAVA/bin/amd64/java.

▼ To specify a JVM™ Installation for the Directory Server

● **Specify a JVM installation for the directory server in one of the following ways:**

- **Set the** OPENDS_JAVA_HOME **environment variable (with the JAVA installation path).**

  The directory server's administrative scripts uses the OPENDS_JAVA_HOME environment variable. If the variable is not set, an error can occur.

  - **Set the** OPENDS_JAVA_BIN **environment variable (with the JAVA binary path).**

    - **Update the contents of the** lib/set-java-home **file (if it exists) with the correct value of the JAVA installation path.**

File Descriptor Requirements (Linux Systems)

To ensure good server performance, the total number of client connections, database files, and log files must not exceed the maximum file descriptor limit on the operating system (`ulimit -n`). By default, the directory server allows an unlimited number of connections but is restricted by the file descriptor limit on the operating system. Linux systems limit the number of file descriptors that any one process may open to 1024 per process. (This condition is not a problem on Solaris machines, x86, x64, or SPARC).

After the directory server has exceeded the file descriptor limit of 1024 per process, any new process and worker threads will be blocked. For example, if the directory server attempts to open a Oracle® Berkeley JE database file when the operating system has exceeded the file descriptor limit, the directory server will no longer be able to open a connection that can lead to a corrupted database exception. Likewise, if you have a directory server that exceeds the file descriptor limit set by the operating system, the directory server can become unresponsive as the LDAP connection handler consumes all of the CPU's processing in attempting to open a new connection.

To fix this condition, set the maximum file descriptor limit per process on Linux machines.

▼ To Increase the File Descriptor Limit (Linux)

1   Display the current hard limit of your machine.

The hard limit is the maximum server limit that can be set without tuning the kernel parameters in `proc` file system.

```
$ ulimit -aH
core file size (blocks)      unlimited
data seg size (kbytes)       unlimited
file size (blocks)           unlimited
max locked memory (kbytes)   unlimited
max memory size (kbytes)     unlimited
open files                   1024
pipe size (512 bytes)        8
stack size (kbytes)          unlimited
cpu time (seconds)           unlimited
max user processes           4094
virtual memory (kbytes)      unlimited
```

2   Edit the `/etc/security/limits.conf` and add the lines:

```
*     soft   nofile  1024
*     hard   nofile  65535
```

3   **Edit the** `/etc/pam.d/login` **by adding the line:**

```
session required /lib/security/pam_limits.so
```

4   **Use the system file limit to increase the file descriptor limit to 65535.**

The system file limit is set in `/proc/sys/fs/file-max` .

```
echo 65535 > /proc/sys/fs/file-max
```

5   **Use the** `ulimit` **command to set the file descriptor limit to the hard limit specified in** `/etc/security/limits.conf`.

```
ulimit -n unlimited
```

6   **Restart your system.**

Specific Requirements for Installation in a Solaris Zone

The Sun OpenDS Standard Edition software treats global, full local, and sparse zones as an independent physical system. Installing the server in any type of Solaris zone is therefore like installing on an independent system. The software does not share services or file locations with other zones.

Getting the Software

The Sun OpenDS Standard Edition software is designed for easy downloading, installation, and configuration. This section describes how to obtain the software.

Instructions for installing and configuring the directory server are described in "Installing the Directory Server" on page 17.

Instructions for installing and configuring the proxy server are described in "Installing the Proxy Server" on page 25.

Getting the Sun OpenDS Standard Edition Software

You can obtain the Sun OpenDS Standard Edition software by using one of the following methods:

- Download the software as a compressed archive (`.zip`) file from the Sun OpenDS download site. The zip distribution is a stand-alone delivery method to install and to configure a Sun OpenDS Standard Edition server instance. The installation process is simple. Download the zip file, and then extract the contents of this zip file to the location where you want to install the server.
- Install the software from the Sun OpenDS Standard Edition Media Kit (part number: `DSS99-220C99M9`). Copy the zip file (`SunOpenDS_SE2.2.zip`) from the Media Kit to a writable file system and extract the contents of the file to the location where you want to install the server.

▼ To Download the Sun OpenDS Standard Edition Software

1 **Point your browser to the Sun OpenDS download site.**

2 **Click Sun Download Gateway, and follow the instructions to save the zip file locally on your computer.**

3 **Unzip the zip compressed archive file.**
```
$ unzip SunOpenDS_SE2.2.zip
```

If your system does not include a utility for extracting zip archives, you can use the `jar` tool provided with the Java environment.

```
$ jar -xvf SunOpenDS_SE2.2.zip
```

4   Change to the SunOpenDS_SE2.2 **subdirectory.**

```
$ cd SunOpenDS_SE2.2
```

5   View the contents of the SunOpenDS_SE2.2 **subdirectory.**

```
(UNIX, Linux)   $ ls
(Windows)       C:\> dir
addons          import-tmp    opends_logo.png  Uninstall.app
bak             install.html  QuickSetup.app   uninstall.bat
bat             install.txt   README           upgrade
bin             instance.loc  README.txt       upgrade.bat
changelogDb     ldif          resources        vdp-setup
classes         Legal         setup            vdp-setup.bat
config          lib           setup.bat        vdp-uninstall
db              locks         snmp             vdp-uninstall.bat
example-plugin.zip logs        uninstall
```

▼ To Obtain the Sun OpenDS Standard Edition Software from the Media Kit

1   Insert the Media Kit CD into your cdrom drive.

2   Change to the CD directory.

For example, assume that you have mounted your CD on /vol/cdrom on UNIX or Linux systems, or the E:\ drive on Windows systems.

```
(UNIX, Linux)   $ cd /vol/cdrom
(Windows)       C:\> E:
```

3   The root directory of the CD contains the following files:

```
README.txt
./Legal
    819-0764-10_SLA_Multi.pdf
    License_Notice_Translated.pdf
    OpenDS Standard Edition 2.2 250 Perpetual Entitlement.txt
    OpenDS Standard Edition 2.2 1000 Perpetual Entitlement.txt
    OpenDS Standard Edition 2.2 Subscription Entitlement 250.sxw
    OpenDS Standard Edition 2.2 Subscription Entitlement 1000.sxw
    Software_License_Agreement.txt
    Sun OpenDS Standard Edition 2.2 Distributionreadme.txt
SunOpenDS_SE2.2.zip
```

4 Copy the zip file to a writable file system, for example:

```
(UNIX, Linux)   $ mkdir /local/sunopends
                $ cd /local/sunopends
                $ cp /vol/cdrom/SunOpenDS_SE2.2.zip /local/sunopends

(Windows)       E:\> mkdir C:\sunopends
                E:\> C:
                C:\> cd sunopends
                C:\sunopends> xcopy E:\SunOpenDS_SE2.2.zip C:\sunopends
```

5 Unzip the zip compressed archive file.

```
$ unzip SunOpenDS_SE2.2.zip
```

If your system does not include a utility for extracting zip archives, you can use the jar tool provided with the Java environment.

```
$ jar -xvf SunOpenDS_SE2.2.zip
```

6 Change to the SunOpenDS_SE2.2 **subdirectory.**

```
$ cd SunOpenDS_SE2.2
```

7 View the contents of the SunOpenDS_SE2.2 **subdirectory.**

```
(UNIX, Linux)   $ ls
(Windows)       C:\> dir
addons             import-tmp   opends_logo.png  Uninstall.app
bak                install.html QuickSetup.app   uninstall.bat
bat                install.txt  README           upgrade
bin                instance.loc README.txt       upgrade.bat
changelogDb        ldif         resources        vdp-setup
classes            Legal        setup            vdp-setup.bat
config             lib          setup.bat        vdp-uninstall
db                 locks        snmp             vdp-uninstall.bat
example-plugin.zip logs         uninstall
```

Registering the Sun OpenDS Standard Edition Software

Once you have installed the Sun OpenDS Standard Edition, you should register the software at the following location: https://inventory.sun.com.

Installing the Directory Server

The directory server is designed for easy installation, and configuration.

The topics in this section assume that you have already obtained the software using one of the methods described in "Getting the Software" on page 13.

Setting Up the Directory Server

You can set up the directory server in two modes:

- **Graphical user interface (GUI) mode**. GUI mode 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. Finally, the installer includes the ability to invoke the GUI control panel at the end of the configuration process.

- **Command-line interface (CLI) mode**. The command-line mode prompts you for required information before the configuration begins.

▼ To Set Up the Directory Server Using the GUI

1 **After you have unpacked the software, change to the installation subdirectory.**

```
(UNIX, Linux)  $ cd SunOpenDS_SE2.2
(Windows)      C:\> cd SunOpenDS_SE2.2
```

2 **Type** setup **to configure the directory server installation.**

The utility launches the graphical installer.

```
(UNIX, Linux)  $ setup
(Windows)      C:\> setup.bat
```

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

4 **On the License panel, select the checkbox to accept the license and click Next.**

5   On the Server Settings panel, type the following information:

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

The default is the local host name.

b. *LDAP Listener Port.* **Type the LDAP port for the directory server.**

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.

c. *Administration Connector Port.* **Type 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 *Sun OpenDS Standard Edition 2.2 Administration Guide*.

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

Complete the following information:

i. *SSL Access.* **Select Enable SSL and type a valid port for secure LDAP operations.**

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.

ii. *StartTLS Access.* **Click Enable StartTLS for LDAP.**

iii. *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. Type the Keystore Path, and Keystore PIN if necessary.

iv. Click OK to continue.

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

f. *Password.* **Type 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 .

7 **Click Next to Continue.**

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

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

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

    b. Directory Data. Select one of the 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 Review panel, review your configuration.**

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

10 **Click Finish.**

11 **(Optional) On the Finished panel, click Launch Control Panel to see the server configuration status and to perform basic administration tasks on the server.**

12 **Click Close.**

▼ To Set Up the Directory Server Using the CLI

1 **After you have unpacked the software, change to the installation subdirectory.**

```
(UNIX, Linux)  $ cd SunOpenDS_SE2.2
(Windows)      C:\> cd SunOpenDS_SE2.2
```

2 **Type** setup **with the** --cli **option to launch the install in interactive mode.**

```
(UNIX, Linux)  $ setup --cli
(Windows)      C:\> setup.bat -cli
```

3   **Type Yes and press Enter to accept the license agreement.**

4   **Type 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   **Type 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   **Type 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 *Sun OpenDS Standard Edition 2.2 Administration Guide*.

8   **Type 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.

9   **Type an option 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.**

10 **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.

11 **Type** `yes` **if you want to enable StartTLS.**

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

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

14 **Confirm your configuration, and type** `1` **or press Enter or Return to accept the default to complete the configuration process.**

Enabling SSL and StartTLS in QuickSetup

The easiest way to get the directory server up and running with SSL, StartTLS, or both, is to use the setup GUI. This tool can be used to set up the server after you have downloaded it as a zip file. QuickSetup enables you to use a self-signed certificate, or an existing certificate in a JKS keystore, a PKCS#12 file, or a PKCS#11 token.

To access the SSL and StartTLS configuration, click the Configure button in front of the LDAP Secure Access field. The following dialog is displayed:

The following fields are included on this screen:

- **SSL Access.** Select this checkbox 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.

- **StartTLS Access.** Select this checkbox to configure whether the LDAP connection handler will 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 will generate 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 will use 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 *Sun OpenDS Standard Edition 2.2 Administration Guide*.

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 *Sun OpenDS Standard Edition 2.2 Administration Guide*.

▼ To Set Up Replication in GUI Mode

1 For the first directory server in your replication topology, follow the instructions in **"To Set Up the Directory Server Using the GUI" on page 17**.

2 On the Topologies screen, do following:

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

   b. Type the replication port number or accept the default port 8989.

> **Note –** The replication port must 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.

> **Note –** Record the replication port, 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 If you are running the second directory server on the same host, unzip the Sun OpenDS Standard Edition software in a different subdirectory.

5 Follow the instructions in **"To Set Up the Directory Server Using the GUI" on page 17**.

6   **On the Topologies screen, do the following:**

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

    b. **Type 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.**

       ■ **Host Name. Type the Host Name for the first directory server.**

       ■ **Port. Type the administration port for the first directory server.**

       ■ **Admin User. Type the bind DN for the first directory user, or accept the default.**

       ■ **Admin Password. Type a bind password for the Admin user.**

7   **On the Global Administrator screen, type a password for the Global Administrator for the replication servers.**

8   **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.**

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

10   **Repeat these procedures to set up additional servers in the replication topology.**

Installing the Proxy Server

This section details all the installation and configuration steps needed to get your Sun OpenDS Standard Edition proxy up and running. The following section gives you an overview of the tested Sun OpenDS Standard Edition proxy deployments. Other deployments are possible, but the following deployments have been tested extensively.

Note – You will need one or more back-end LDAPv3–compliant directory servers installed to use Sun OpenDS Standard Edition proxy. The tested directory servers are: Sun OpenDS Standard Edition (2.2 and 2.0) and Sun Directory Server Enterprise Edition 7.0.

For a description of the different deployments, see Chapter 6, "Example Deployments Using the Proxy Server," in *Sun OpenDS Standard Edition 2.2 Deployment Planning Guide*.

Before you begin your Sun OpenDS Standard Edition proxy installation, determine the deployment architecture that you want to implement.

1. Simple load balancing
2. Simple distribution
3. Distribution with load balancing
4. Failover between data centers
5. Distribution with failover between data centers

A global index catalog can be incorporated in any scenario which uses distribution. For information on creating a global index catalog, see "Configuring the Global Index" in *Sun OpenDS Standard Edition 2.2 Administration Guide*.

Setting Up the Proxy Server

You can install Sun OpenDS Standard Edition proxy in two modes:

- **Graphical user interface (GUI) mode.** vdp-setup has a Java-based graphical tool that enables you to install and configure all the elements required to install and configure a set number of deployments of Sun OpenDS Standard Edition proxy, in very little time.

> **Note –** The GUI setup can only be used once. For any modifications to your installation, you will need to use dsconfig.

- **Command-line interface (CLI) mode.** Using vdp-setup in command-line mode will prompt you for the first few steps of the Sun OpenDS Standard Edition proxy installation. For a complete deployment, you will need to configure a number of additional elements (such as distribution and/or load balancing) using dsconfig.

To Set Up the Proxy Using the vdp-setup GUI

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

You can only run vdp-setup once. Make sure that you have clearly determined the best deployment architecture. For a description of the deployment scenarios, see Chapter 6, "Example Deployments Using the Proxy Server," in *Sun OpenDS Standard Edition 2.2 Deployment Planning Guide*.

Presentation of the vdp-setup Window

The vdp-setup has a GUI that guides you through the installation and configuration of your Sun OpenDS Standard Edition proxy deployment.

The vdp-setup installation window is organized as follows:

- The left hand pane lists the steps of the setup process. When you choose the deployment type, the deployment sub-steps will change dynamically.
- The arrow on the left hand 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.

> **Note –** Your Sun OpenDS Standard Edition proxy is only complete when you reach the Finish step.
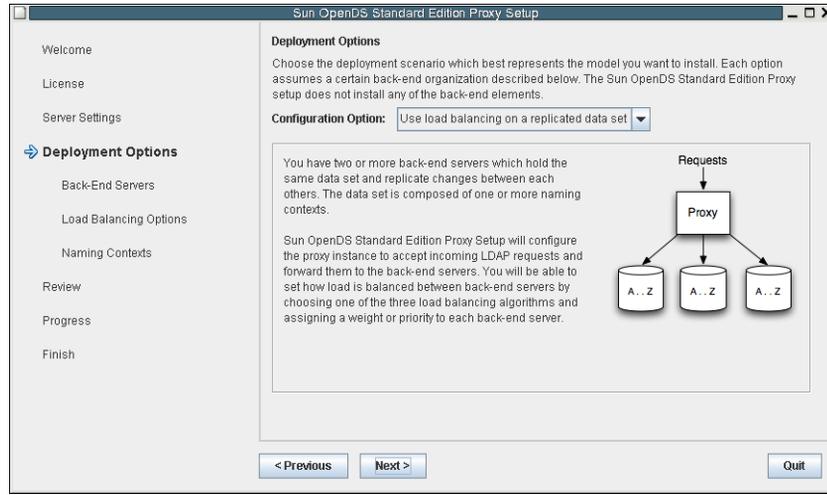
FIGURE 1   The Proxy Setup Window

▼ To Configure Simple Load Balancing

1   To launch the GUI install, type:

```
(Unix, Linux) $ vdp-setup
(Windows) C:\> vdp-setup.bat
```

The installation wizard is launched.

Note – If you are installing Sun OpenDS Standard Edition proxy on Windows, you may have to update the java path.

---

2   On the Welcome panel, click Next.

3   On the License panel, select the checkbox to accept the license and click Next.

4   Enter the proxy server settings (name and port) and click Next.

By default, the local hostname will be entered as the hostname, but this is an editable field. The ports are also predefined with an available port number. Make sure that you have the privileges on the port.

5   (Optional) If you want to configure a secure LDAP port (LDAPS), click on the Configure button.

Use the Configure Secure Access window to configure LDAPS access to Sun OpenDS Standard Edition proxy. Figure 2 illustrates the Configure Secure Access panel of the vdp-setup GUI.

Note – The PCKS #11 format is not supported in this release of Sun OpenDS Standard Edition proxy.

If you do not already have an existing certificate, for testing purposes you can automatically generate a self-signed certificate by selecting the Generate Self-Signed Certificate button.

If you have an existing certificate, select the Use an existing Certificate button and select the appropriate keystore type. Provide the location of the keystore and provide the keystore password, also known as the keystore PIN.

FIGURE 2 Configure Secure Access Panel of the vdp-setup GUI

6 **Select the load balancing configuration from the Configuration Option drop-down menu.**

For a general presentation of different deployment scenarios possible using the Sun OpenDS Standard Edition proxy, see Chapter 6, "Example Deployments Using the Proxy Server," in *Sun OpenDS Standard Edition 2.2 Deployment Planning Guide*.

Note – If you select Configure later, only the server settings configured in the previous step will be setup. You will then have to use the CLI to configure your deployment.

7 **Select the remote LDAP servers which holds the corresponding partitioned data.**

Note – For a load balancing configuration, your back-end LDAP servers should be replicated.

- **If you have Sun OpenDS Standard Edition directory servers or Sun Directory Server Enterprise Edition 7.0 servers installed:**

  a. **Click on Add Sun Servers.**

  b. **Select if you want to connect to Sun OpenDS Standard Edition servers or DSCC registry.**

  c. **Enter the LDAP hostname and port number.**

     - **If you choose Sun OpenDS, then enter the administrative credentials of one of the Sun OpenDS Standard Edition servers.**

       The vdp-setup will discover and display all the replicated Sun OpenDS Standard Edition servers.

     - **If you choose Sun DSEE, then enter the Directory Service Manager credentials of your DSCC registry.**

       The vdp-setup will discover and display all the Sun Directory Server Enterprise Edition 7.0 server instances registered in the DSCC registry.

  d. **Select if you want to use an LDAP connection or a secure connection (LDAPs).**

  e. **Enter the password of the server.**

  f. **Click Connect.**

  g. **Leave all Sun servers you want to use for your deployment selected.**

  h. **Click OK.**

- **To enter the back-end LDAP server information manually:**

  a. **Click Add server.**

  b. **Enter the server name, port and security settings.**

     Note – The security settings you set here will determine the security between the Sun OpenDS Standard Edition proxy and back-end LDAP servers. For more information on setting security options, see "Configuring Security Between the Proxy and the Data Source" in *Sun OpenDS Standard Edition 2.2 Administration Guide*.

  c. **Click Add.**

  d. **Click Close once you have added all the remote LDAP servers required.**

8   Choose the load balancing algorithm.

9   Set the load balancing algorithm properties:

- **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 amount of requests.

  Once you have completed the vdp-setup installation, the weight can be set to a different value for each operation type. For more information, see "Modifying Load Balancing Properties" in *Sun OpenDS Standard Edition 2.2 Administration Guide*.

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

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

- **For saturation, set the order in which the servers are used as well as the saturation threshold of each server.**

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

10   Enter the naming context.

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

- **If no list of naming context is proposed, you will need to manually enter the DN of the naming context you want to use.**

  For example, dc=example,dc=com

11   Check the summary page to ensure that the deployment corresponds to what you want.

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

12   To view the commands that will be launched for your installation, select Show Commands.

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.

13   Click Finish to launch your deployment.

Note – Once your installation is complete, you can use dsconfig in the command line if you want to modify the current installation. For more information, see "Configuring the Server With dsconfig" in *Sun OpenDS Standard Edition 2.2 Administration Guide*.

▼ To Configure Simple Distribution

1 To launch the GUI install, type:

```
(Unix, Linux) $ vdp-setup
(Windows) C:\> vdp-setup.bat
```

The installation wizard is launched.

Note – If you are installing Sun OpenDS Standard Edition proxy on Windows, you may have to update the java path.

2 On the Welcome panel, click Next.

3 On the License panel, select the checkbox to accept the license and click Next.

4 Enter the proxy server settings (name and port) and click Next.

By default, the local hostname will be entered as the hostname, but this is an editable field. The ports are also predefined with an available port number. Make sure that you have the privileges on the port.

5 (Optional) If you want to configure a secure LDAP port (LDAPS), click on the Configure button.

Use the Configure Secure Access window to configure LDAPS access to Sun OpenDS Standard Edition proxy. Figure 2 illustrates the Configure Secure Access panel of the vdp-setup GUI.

Note – The PCKS #11 format is not supported in this release of Sun OpenDS Standard Edition proxy.

If you do not already have an existing certificate, for testing purposes you can automatically generate a self-signed certificate by selecting the Generate Self-Signed Certificate button.

If you have an existing certificate, select the Use an existing Certificate button and select the appropriate keystore type. Provide the location of the keystore and provide the keystore password, also known as the keystore PIN.

FIGURE 3   Configure Secure Access Panel of the vdp-setup GUI

6   Select the distribution configuration from the Configuration Option drop-down menu.

For a general presentation of different deployment scenarios possible using the Sun OpenDS
Standard Edition proxy, see "Deciding Your Proxy Deployment Type" in *Sun OpenDS
Standard Edition 2.2 Deployment Planning Guide*.

Note – If you select Configure later, only the server settings configured in the previous step will
be setup. You will then have to use the CLI to configure your deployment.

---

7   Select the number of partitions on which the data is separated.

For the example distribution scenario, select two partitions.

8   Define how the data distribution will be done.

a.   Enter the naming context.

For example,dc=example,dc=com.

b.   Enter the distribution base DN.

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

c.   Enter the distribution attribute.

For example,uid.

9 Select the type of distribution algorithm and define the boundaries of each partition:

If you use the Set Default Boundaries button, the vdp-setup will set default boundaries, which may not correspond to your deployment. However, this may be useful for test purposes.

Note – You cannot set a distribution using DN pattern with the vdp-setup GUI. For more information on creating a distribution using DN pattern match, see "Creating a dnpattern Distribution Partition" in *Sun OpenDS Standard Edition 2.2 Administration Guide*.

- **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.

- **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.

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.

---

10 For each partition, select the remote LDAP server which holds the corresponding partitioned data.

Note – If you add two servers for one partition, you must then set load balancing between these servers. This use case is explained in the example "To Configure Distribution with Load Balancing" on page 35.

- **If you have Sun OpenDS Standard Edition directory servers or Sun Directory Server Enterprise Edition 7.0 servers installed:**

  a. Click on Add Sun Servers.

  b. Select if you want to connect to Sun OpenDS servers or DSCC registry.

    c. Enter the LDAP hostname and port number.

       ■ **If you choose Sun OpenDS, then enter the administrative credentials of one of the Sun OpenDS Standard Edition servers.**

       The vdp-setup will discover and display all the replicated Sun OpenDS Standard Edition directory servers.

       ■ **If you choose Sun DSEE, then enter the Directory Service Manager credentials of your DSCC registry.**

       The vdp-setup will discover and display all the Sun Directory Server Enterprise Edition 7.0 server instances registered in the DSCC registry.

    d. Select if you want to use an LDAP connection or a secure connection (LDAPs).

    e. Enter the password of the server.

    f. Click Connect.

    g. Leave all Sun servers you want to use for your deployment selected.

    h. Click OK.

   ■ **To enter the back-end LDAP server information manually:**

    a. Click Add server.

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

Note – The security settings you set here will determine the security between the Sun OpenDS Standard Edition proxy and remote servers. For more information on setting security options, see "Configuring Security Between the Proxy and the Data Source" in *Sun OpenDS Standard Edition 2.2 Administration Guide*.

---

    c. Click Add.

    d. Click Close once you have added all the LDAP servers required.

11 To configure a global index, see "Creating Global Index Catalogs Using vdp-setup**" on page 40.**

Global indexes are optional. For more information on configuring and using global indexes, see "Configuring the Global Index" in *Sun OpenDS Standard Edition 2.2 Administration Guide*.

12 Check the summary page to ensure that the deployment corresponds to what you want.

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

13   To view the commands that will be launched for your installation, select Show Commands.

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

14   Click Finish to launch your deployment.

Note – Once your installation is complete, you can use dsconfig in the command line if you want to modify the current installation. For more information, see "Configuring the Server With dsconfig" in *Sun OpenDS Standard Edition 2.2 Administration Guide*.

▼ To Configure Distribution with Load Balancing

1   To launch the GUI install, type:

```
(Unix, Linux) $ vdp-setup
(Windows) C:\> vdp-setup.bat
```

The installation wizard is launched.

Note – If you are installing Sun OpenDS Standard Edition proxy on Windows, you may have to update the java path.

---

2   On the Welcome panel, click Next.

3   On the License panel, select the checkbox to accept the license and click Next.

4   Enter the proxy server settings (name and port) and click Next.

By default, the local hostname will be entered as the hostname, but this is an editable field. The ports are also predefined with an available port number. Make sure that you have the privileges on the port.

5   (Optional) If you want to configure a secure LDAP port (LDAPS), click on the Configure button.

Use the Configure Secure Access window to configure LDAPS access to Sun OpenDS Standard Edition proxy. Figure 2 illustrates the Configure Secure Access panel of the vdp-setup GUI.

Note – The PCKS #11 format is not supported in this release of Sun OpenDS Standard Edition proxy.

If you do not already have an existing certificate, for testing purposes you can automatically generate a self-signed certificate by selecting the Generate Self-Signed Certificate button.

If you have an existing certificate, select the Use an existing Certificate button and select the appropriate keystore type. Provide the location of the keystore and provide the keystore password, also known as the keystore PIN.

FIGURE 4   Configure Secure Access Panel of the vdp-setup GUI

6   **Select the distribution configuration from the Configuration Option drop-down menu.**

For a general presentation of different deployment scenarios possible using the Sun OpenDS Standard Edition proxy, see "Deciding Your Proxy Deployment Type" in *Sun OpenDS Standard Edition 2.2 Deployment Planning Guide*.

Note – If you select Configure later, only the server settings configured in the previous step will be setup. You will then have to use the CLI to configure your deployment.

---

7   **Select the number of partitions on which the data is separated.**

For the example distribution scenario, select two partitions.

8   **Define how the distribution of data will be done.**

a.   **Enter the naming context.**

For example,dc=example,dc=com.

b.   **Enter the distribution base DN.**

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

c.   **Enter the distribution attribute.**

For example,uid.

9   **Select the type of distribution algorithm and define the boundaries of each partition:**

If you use the Set Default Boundaries button, the vdp-setup will set default boundaries, which may not correspond to your deployment. However, this may be useful for test purposes.

Note – You cannot set a distribution using DN pattern with the vdp-setup GUI. For more information on creating a distribution using DN pattern match, see "Creating a dnpattern Distribution Partition" in *Sun OpenDS Standard Edition 2.2 Administration Guide*.

- **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.

- **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.

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

---

10 **For each partition, select the back-end LDAP server which holds the corresponding partitioned data.**

Note – You must select at least two back-end LDAP servers per partition to deploy distribution with load balancing.

- **If you have Sun OpenDS or Sun DSEE LDAP servers installed:**

  a. **Click on Add Sun Servers.**

  b. **Select if you want to connect to Sun OpenDS or DSEE servers.**

  c. **Enter the LDAP hostname and port number.**

     - **If you choose Sun OpenDS, then also enter the administrative credentials of one of the Sun OpenDS Standard Edition servers.**

       The vdp-setup will discover and display all the replicated Sun OpenDS Standard Edition servers.

     - **If you choose Sun DSEE, then also enter the Directory Service Manager credentials of your DSCC registry.**

       The vdp-setup will discover and display all the DSEE instances registered in the DSCC registry.

    d.   **Enter the password of the LDAP server.**

    e.   **Click Connect.**

    f.   **Leave the Sun LDAP server you want to use for your deployment selected.**

    g.   **Click OK.**

■ **To enter the back-end LDAP server information manually:**

    a.   **Click Add server.**

    b.   **Enter the server name, port and security settings.**

> **Note –** The security settings you set here will determine the security between the Sun OpenDS Standard Edition proxy and remote servers. For more information on setting security options, see "Configuring Security Between the Proxy and the Data Source" in *Sun OpenDS Standard Edition 2.2 Administration Guide*.

    c.   **Click Add.**

    d.   **Click Close once you have added all the LDAP servers required.**

11   **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.**

■ **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 amount of requests.

Once you have completed the vdp-setup installation, the weight can be set to a different value for each operation type. For more information, see "Modifying the Load Balancing Route Properties" in *Sun OpenDS Standard Edition 2.2 Administration Guide*.

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

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

- **For saturation, set the order in which the servers are used as well as the saturation threshold of each server.**

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

12 **To configure a global index, see "Creating Global Index Catalogs Using** vdp-setup**" on page 40.**

Global indexes are optional. For more information on configuring and using global indexes, see "Configuring the Global Index" in *Sun OpenDS Standard Edition 2.2 Administration Guide*.

13 **Check the summary page to ensure that the deployment corresponds to what you want.**

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

14 **To view the commands that will be launched for your installation, select Show Commands.**

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 launch your deployment.**

Note – Once your installation is complete, you can use dsconfig in the command line if you want to modify the current installation. For more information, see "Configuring the Server With dsconfig" in *Sun OpenDS Standard Edition 2.2 Administration Guide*.

▼ To Install a Proxy Using the vdp-setup CLI

Using vdp-setup at the command line defines the proxy port, hostname, and security configuration.

Note – To complete your deployment and define load balancing or distribution, use dsconfig, as described in Chapter 7, "Simple Proxy Deployments Using the Command Line Interface," in *Sun OpenDS Standard Edition 2.2 Deployment Planning Guide*.

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 *Sun OpenDS Standard Edition 2.2 Command-Line Usage Guide*.

1 **Type** setup **with the** --cli **option to launch the install in interactive mode.**

```
(Unix, Linux) $ vdp-setup --cli -p 1389 --adminConnectorPort 4444 -D"cn=Directory Manager" -w password
```

In the example above, -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 -w is the proxy LDAP bind password.

Launch vdp-setup –cli for a full description of the command-line.

■ **If you want, you can type the complete command, to avoid using the interactive mode.**

```
(Unix, Linux) $ vdp-setup --cli -p 1389 --adminConnectorPort 4444 -D"cn=Directory Manager" -w password
```

2   **Type Yes and press Enter to accept the license agreement.**

3   **Type the root user DN, or press Enter or Return to accept the default (**cn=Directory Manager**).**

4   **Provide a password for the root user and re-enter the password to confirm it.**

5   **Type 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.

6   **To complete your deployment, you will need to create the workflow elements, workflows, network group and so on.**

   The list of components to install will depend on your deployment architecture. For examples based on the supported use cases, see Chapter 7, "Simple Proxy Deployments Using the Command Line Interface," in *Sun OpenDS Standard Edition 2.2 Deployment Planning Guide*.

Creating Global Index Catalogs Using vdp-setup

You can use the vdp-setup GUI or command line to install the Sun OpenDS Standard Edition proxy. During the Deployment Options step of the GUI version of vdp-setup, you have the option of creating global indexes.

You are not obliged to create global indexes at this stage, but for convenience it is possible during the Sun OpenDS Standard Edition proxy installation process to establish which attributes you want to select for global indexes, and vdp-setup then performs the following actions:

1. The vdp-setup tool automatically creates a global index catalog, by default named gi-catalog.

2. The vdp-setup tool populates the global index catalog with global indexes of the attributes you selected. The vdp-setup tool associates all global indexes to the same default global index catalog, named gi-catalog, and creates a global index replication administrator with the same password as the directory manager.

You can see the actions that vdp-setup performs by checking the selecting the Show Commands option during installation, or by checking the vdp-setup log file after installation is complete. On UNIX systems, the log file is located at *install-dir*/logs/vdp-setup. On Microsoft

Windows systems, the log file is located at *install-dir*\logs\vdp-setup. For information on the vdp-setup log file, see "Accessing Logs" in *Sun OpenDS Standard Edition 2.2 Administration Guide*.

You can also choose to ignore the option to have vdp-setup create a global index catalog for you, and you can instead manually create and populate global index catalogs later, as described in "To Create a Global Index Catalog Containing Global Indexes" in *Sun OpenDS Standard Edition 2.2 Administration Guide*.

Note – During the Global Index creation in vdp-setp, *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 *Sun OpenDS Standard Edition 2.2 Administration Guide*.

Duplicating Your Proxy Installation

If you want to set up a replicated Sun OpenDS Standard Edition proxy, you will need to duplicate your Sun OpenDS Standard Edition proxy installation.

▼ To Duplicate Your Proxy Installation Using vdp-setup GUI

If you are using vdp-setup GUI to create your Sun OpenDS Standard Edition proxy installation, you can easily copy the commands that are launched by vdp-setup prior to completing the installation. The commands displayed by vdp-setup are a good starting point for scripting an installation.

Before You Begin   Using the vdp-setup graphical interface, define your installation but do not click Finish.

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

2 **Copy all the commands displayed.**

3 **Paste them into a text file.**
You may now complete your first installation by clicking Finish.

4 **Edit the commands to modify the port, the hostname, and the password.**
You may also have to quote some arguments depending on your shell scripting language.

5 **Save the updated file as a script.**

6 **On the machine where you want to host the next Sun OpenDS Standard Edition proxy, unzip** `SunOpenDS_SE2.2.zip` **file.**

7 **Go to the top level of the installation.**

8 **At the command line, run the script using your shell utility.**

▼ **To Duplicate Your Proxy Installation Using the Installation Log File**

Once you have completed your installation, a log file called `vdp-setup` saves the commands of your installation. You can use this file to duplicate your Sun OpenDS Standard Edition proxy.

1 **Go to the logs folder.**

2 **Open the file** `vdp-setup`**.**

3 **Edit the commands to modify the port, the hostname, and the password.**

You may also have to quote some 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 Sun OpenDS Standard Edition proxy, unzip** `SunOpenDS_SE2.2.zip` **file.**

6 **Go to the top level of the installation.**

7 **At the command line, run the script using your shell utility.**

Ensuring Redundancy

To avoid a single point of failure in your deployment, your Sun OpenDS Standard Edition proxy should be redundant. For more information, see "Multiple Replicated Proxies" in *Sun OpenDS Standard Edition 2.2 Deployment Planning Guide*.

Configuring the JVM, Java Options, and Database Cache

The directory server 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).

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 *install-dir*/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.

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-home	If this property is set to true, the system checks the default.java-home property in this properties file before the checking the OPENDS_JAVA_HOME environment variable. If this property is set to false, the system checks the OPENDS_JAVA_HOME environment variable first.
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.

Configuring JVM Options

The following table summarizes the Java options that can have an impact on the performance of your directory server.

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 Gytes) 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 (`Sun-OpenDS-SE-installation-directory/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 Sun OpenDS SE 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 thewor 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 the Sun OpenDS SE, 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.

Condition	Option	Description
Server Only	-XX:+UseConcMarkSweepGC	Selects the CMS garbage collector. This garbage collector is set for *low pause time*. It will result in a Java application that has a lower average throughput, but much shorter CPU-intensive garbage collections. This option is required in environments that have response time constraints.
	-XX: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.

▼ 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 that a JDK 1.6 be used 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.**

▼ 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.**

▼ To Set 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. For example, if you were importing 200K entries, 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.

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 that 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.

● **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" -w password -X -n \
  set-backend-prop --backend-name userRoot --set db-cache-percent:50
```

▼ To Configure Java Settings With the Control Panel

1   **Change to the appropriate directory.**

```
(UNIX, Linux)  $ cd install-dir/bin
(Windows)      C:\> cd install-dir\bat
```
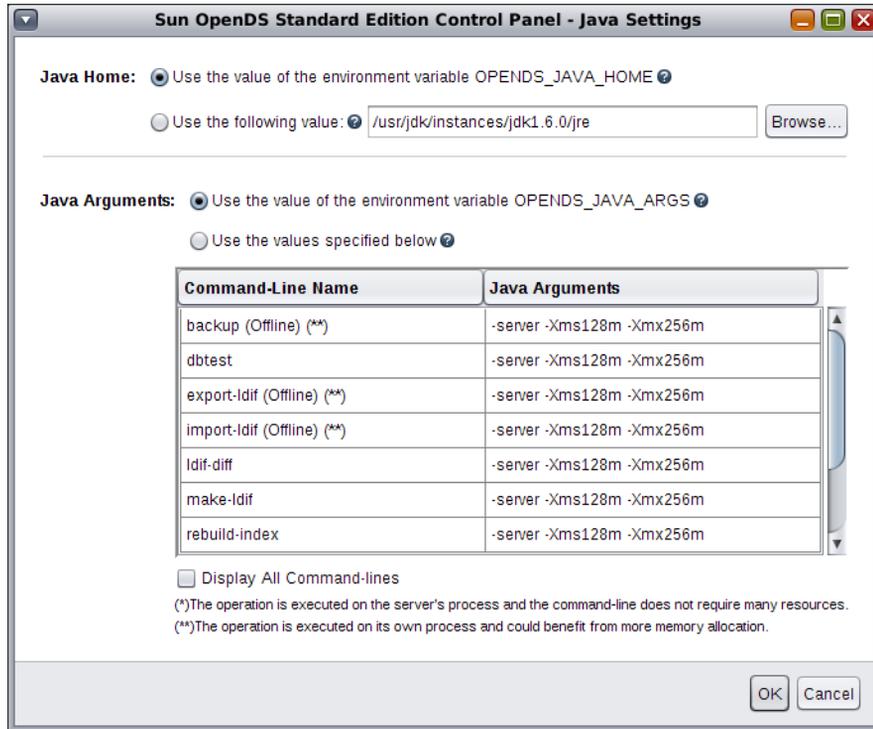
2   **Type** `control-panel` **to open the control panel.**

```
(UNIX, Linux)  $ control-panel
(Windows)      C:\> control-panel
```

3   **Click the Java Settings link under the Runtime Options menu on the left side of the Control Panel window.**

In the Java Settings panel, a list of all directory server commands is displayed, in the left pane.

4   **To specify a path for the Java home directory, accept the default value specified by the**
     OPENDS_JAVA_HOME **environment variable, or select the Use the following value button and**
     enter the path in its field.

     You can also click the Browse button to select a Java home directory from a list of directories.

     If you specify that the directory server is to use OPENDS_JAVA_HOME and the directory server
     cannot access OPENDS_JAVA_HOME for any reason, it uses the path specified for the Java home
     directory. Similarly, if you specify an inaccessible path for the Java home directory, the directory
     server uses OPENDS_JAVA_HOME.

5   **To specify arguments for directory server commands, accept the default value specified by the**
     OPENDS_JAVA_ARGS **environment variable, or specify arguments for a particular command.**

     To specify arguments for a particular command, select the command from the Command-Line
     Name column and edit the command's arguments in the Java Arguments column.

     If you specify that the directory server should use the arguments in OPENDS_JAVA_ARGS and the
     directory server cannot access OPENDS_JAVA_ARGS for any reason, it uses the arguments
     specified in this window. Similarly, if you specify unusable arguments for a command, the
     directory server uses the values specified for the command in OPENDS_JAVA_ARGS.

6   **Click OK button to save your settings.**

Starting and Stopping Your Server Instance

Note – The procedures described in the following sections apply to both the Sun OpenDS Standard Edition directory server and proxy server.

This section includes the following topics:

- "Starting the Server" on page 49
- "Stopping the Server" on page 51
- "Checking if the Server is Started or Stopped" on page 53

Starting the Server

To start the server, run the start-ds command on UNIX or Linux systems or the start-ds.bat command on Windows systems. By default, the start-ds command starts the server as a background process when no options are specified. You can use the start-ds command with the --nodetach option to run the server as a foreground process. For more information, see "start-ds" in *Sun OpenDS Standard Edition 2.2 Command-Line Usage Guide*.

The start-ds command automatically attempts to find the correct Java environment to use when starting the server. You can specify the path to the Java installation, and provide additional options directly to the JVM when the directory server is starting. For more information, see "Configuring the Default JVM and Java Arguments" on page 43.

▼ To Start the Server by Using start-ds

1 Change to the appropriate directory.
```
(UNIX, Linux)  $ cd install-dir/bin
(Windows)      C:\> cd install-dir\bat
```

2 Type start-ds.
```
(UNIX, Linux)  $ start-ds
(Windows)      C:\> start-ds
```

▼ To Start the Server as a Foreground Process

1 Change to the appropriate directory.

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

2 Type start-ds **with** -N **or** --nodetach**.**

```
(UNIX, Linux)    $ start-ds --nodetach
(Windows)        C:\> start-ds --nodetach
```

You can stop the directory server by pressing Control-C in the terminal window in which the server is running or by running the stop-ds utility from another window.

▼ To Start the Server by Using the Control Panel

This procedure describes how to use the Control Panel to administer the directory server.

This procedure applies to the directory server component only. If you have installed a proxy server, use the vdp-control-panel command to launch the proxy control panel.

1 Change to the appropriate directory.

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

2 Type control-panel **to open the GUI control panel.**

```
(UNIX, Linux)    $ control-panel
(Windows)        C:\> control-panel
```

3 On the Server Status panel, click Start.

▼ To Restart the Server

1 Change to the installation directory.

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

2 Type stop-ds **with** -R **or** --restart**.**

```
(UNIX, Linux)    $ stop-ds --restart
(Windows)        C:\> stop-ds --restart
```

▼ To Restart the Server by Using the Control Panel

This procedure describes how to use the Control Panel to administer the directory server.

This procedure applies to the directory server component only. If you have installed a proxy server, use the vdp-control-panel command to launch the proxy control panel.

1 Change to the appropriate directory.

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

2 Type control-panel **to open the GUI control panel.**

```
(UNIX, Linux)  $ control-panel
(Windows)      C:\> control-panel
```

3 On the Server Status panel, click Restart.

4 In the Confirmation dialog, click Yes.

▼ To Start the Server by Using a Script (UNIX/Linux)

The start-ds command provides a "quiet" option (-Q or --quiet) that suppresses output during the startup process unless a significant error occurs. You can use this option in a startup script.

1 Create a shell script and add the following start-ds **command.**

install-dir/bin/start-ds --quiet

2 Run the script.

Stopping the Server

On any system (whether the server is running in the foreground or the background), or even from a remote system, you can stop the server using one of the following methods. For more information about the stop-ds command, see "stop-ds" in *Sun OpenDS Standard Edition 2.2 Command-Line Usage Guide*.

▼ To Stop the Server by Using stop-ds

1 Change to the appropriate directory.

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

2 Type stop-ds

```
(UNIX, Linux)  $ stop-ds
(Windows)      C:\> stop-ds
```

▼ To Stop the Server by Using the Control Panel

This procedure describes how to use the Control Panel to administer the directory server.

This procedure applies to the directory server component only. If you have installed a proxy server, use the vdp-control-panel command to launch the proxy control panel.

1 Change to the appropriate directory.

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

2 Type control-panel **to open the GUI control panel.**

```
(UNIX, Linux)  $ control-panel
(Windows)       C:\> control-panel
```

3 On the Server Status panel, click Stop.

4 On the Confirmation dialog, click Yes.

▼ To Stop the Server that is Running in the Foreground

This procedure assumes that the directory server is running as a foreground process (using the -N or --nodetach option).

● **Type Control-C in a terminal window on UNIX or in the Command Prompt window on Windows systems to stop the server.**

Alternatively, run the stop-ds command from another window.

▼ To Stop the Server by Using a Script (UNIX/Linux)

The stop-ds command provides a "quiet" option (-Q or --quiet) that suppresses output during the stopping process unless a significant error occurs. You can use this option in a shutdown script.

1 Create a shell script and add the following stop-ds **command.**

install-dir/bin/stop-ds --quiet

2 Run the script.

Checking if the Server is Started or Stopped

At any time, you can check if the server is started or stopped by using the `status` command.

▼ To Check the Server Status Using the CLI

1 Change to the appropriate directory.

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

2 Type status

```
(UNIX, Linux)  $ status
(Windows)      C:\> status
```

▼ To Check the Directory Server Status By Using the Control Panel

1 Change to the appropriate directory.

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

2 Type control-panel

- **On Windows systems, use the** bat\control-panel.bat **to start the control panel.**

The status of the server is indicated in the Server Status area.

▼ To Check the Proxy Server Status By Using the Control Panel

1 Change to the appropriate directory.

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

2 Type bin/vdp-control-panel

- **On Windows systems, use the** bat\vdp-control-panel.bat **to start the control panel.**

The status of the Sun OpenDS Standard Edition proxy is indicated in the Server Status area.

Managing the Server as a Service

This section includes the following topics:

Managing the Server as a Windows Service

Use the windows-service command to enable or disable the server as a Windows service. For more information, see "windows-service" in *Sun OpenDS Standard Edition 2.2 Command-Line Usage Guide*.

▼ To Enable the Server as a Windows Service

● **Use the** windows-service **command, as follows:**

```
C:\> windows-service -e
```

▼ To Disable the Server as a Windows Service

● **Use the** windows-service **command, as follows:**

```
C:\> windows-service -d
```

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 OPENDS_WINDOWS_SERVICE_START_NTRIES system environment variable.

Removing the Sun OpenDS Standard Edition Windows Service

The uninstaller can, in most cases, cleanly uninstall and remove Sun OpenDS Standard Edition from your system. However, for Windows platforms, there might be times when the uninstaller fails to remove files due to an active Windows service. For example, the `uninstall` utility might display the following error message.
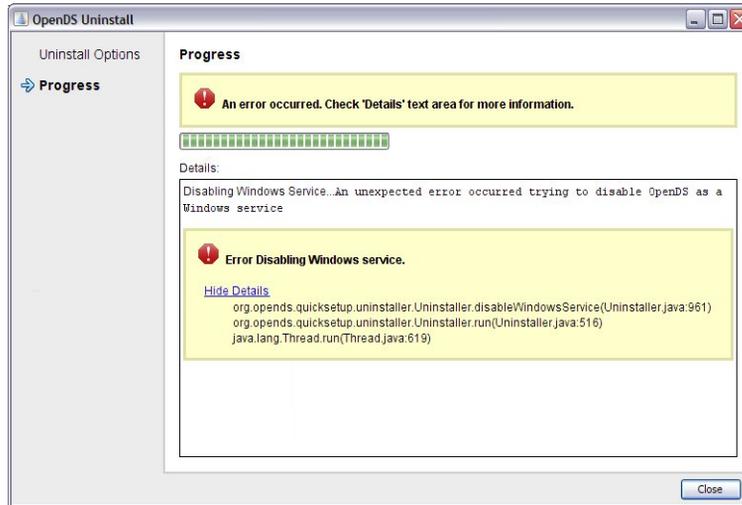
In this case, the uninstaller failed due to the presence of the Windows service in the service manager, which prevents the uninstaller from deleting all of the instance directories. As a result, the Windows service remains, even though the uninstaller has removed some files and directories from the instance.
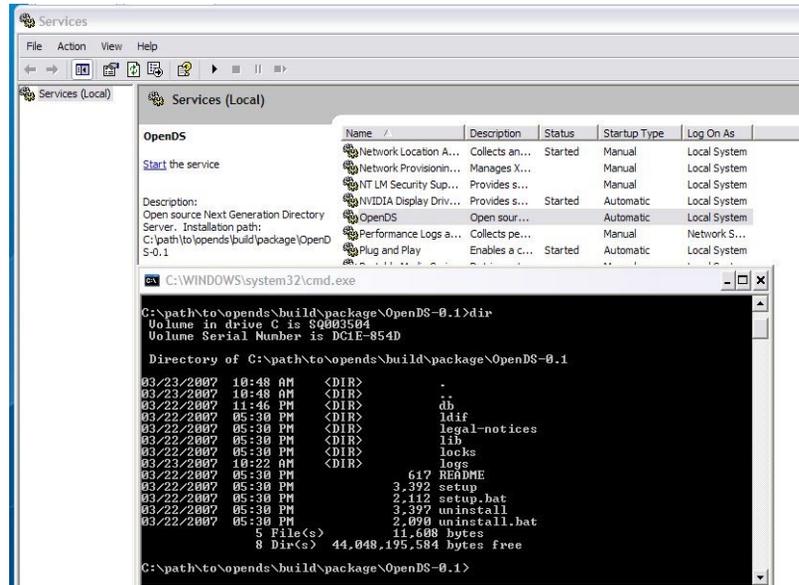
You can remove the remaining Windows service in two ways:

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

▼ 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 *install-dir*\bat.

1   Use the windows-service.bat **command with the** --cleanupService **option.**

Type the serviceName that you want to remove.

C:\> **windows-service --cleanupService serviceName**

2   Restart Windows to complete the cleanup.

Note – This command removes Sun OpenDS Standard Edition services only. The command will not clean up another product's services.

▼ To Manually Remove the Sun OpenDS Standard Edition 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->OpenDS`

> **Note** – If you installed more than one instance of OpenDS, the added services are named OpenDS-2, OpenDS-3, and so on.

3 **Make sure to check which instance the service that you are about to remove points to.**

4 **Delete the entry from the Registry.**
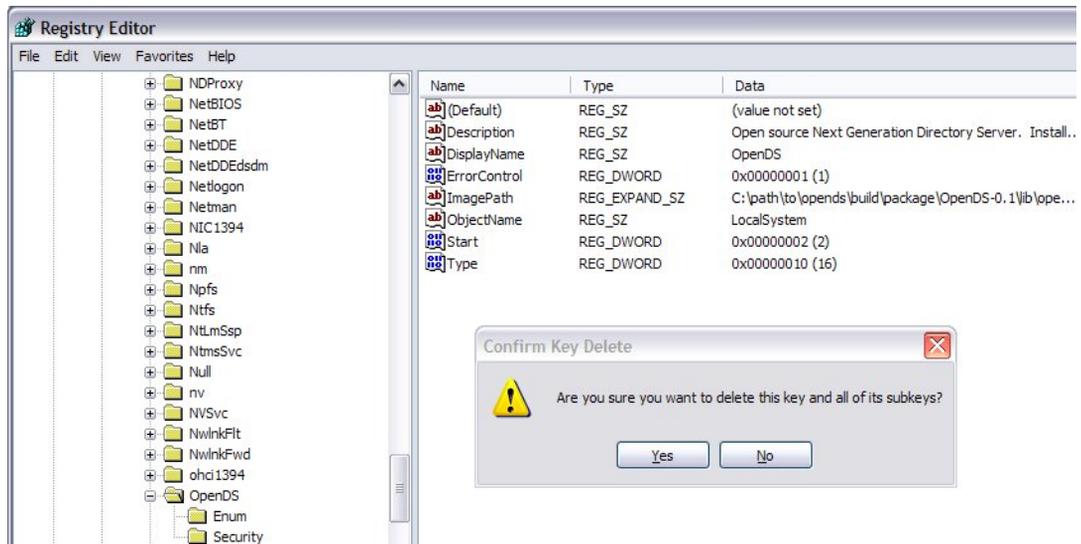
5 **Search the registry for** `LEGACY_OPENDS` **control sets that might be saved in other control sets.**

Search the following:

`HKEY_LOCAL_MACHINE->SYSTEM->ControlSetxyz->Enum->Root->LEGACY_OPENDS-w`

where w is the number of Sun OpenDS Standard Edition 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.
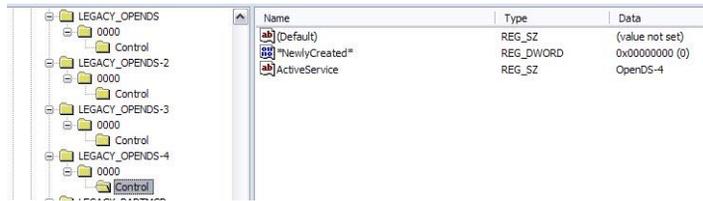
Depending on your profile, your system configuration, and the control set you are trying to edit, the registry entries may be protected from deletion. In this case, it could indicate that you need Administrator privileges to do this operation or that the system control set will be refreshed the next time Windows starts up successfully, and thus confirming that the current configuration is valid.

6   Delete the instance directory to make sure you have completely uninstalled Sun OpenDS Standard Edition.

7   Restart Windows.

The Windows service should be removed.

Uninstalling the Directory Server

The following procedures describe how to uninstall an Sun OpenDS Standard Edition directory server.

Note – To uninstall a Sun OpenDS Standard Edition proxy, see "Uninstalling the Proxy" on page 67.

You can uninstall the directory server using one of the following modes:

- **Graphical user interface (GUI) mode**. See "To Uninstall the Directory Server in GUI Mode" on page 61.
- **Interactive command-line mode**. See "To Uninstall the Directory Server Using the CLI" on page 62.
- **Using a Script**. See "To Uninstall the Directory Server by Using a Script (UNIX/Linux Only)" on page 64.

For more information about the `uninstall` command, see "uninstall" in *Sun OpenDS Standard Edition 2.2 Command-Line Usage Guide*.

▼ To Uninstall the Directory Server in GUI Mode

GUI mode is the default and recommended uninstall option. The GUI provides an easy interface for removing a directory server installation.

1 **Go to the Sun OpenDS Standard Edition installation subdirectory.**

2 **Type** `uninstall` **to launch the graphical uninstaller.**
```
(UNIX, Linux) $ uninstall
(Windows)     C:\> uninstall.bat
```

3 **Clear any components that you want to remove, confirm that you want to delete them, and click Uninstall.**

Note – By default, all components are selected for removal.

---

4   **If your directory 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.

5   **If your directory server is a standalone server and is running, a dialog box is displayed, asking to shut down the directory server before continuing with the uninstall.**

Click Yes to have the uninstaller stop the server for you and continue with the uninstallation.

6   **On the dialog, make note of any files or directories that require manual removal and click Close.**

7   **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 opends-uninstall-*IDNumber*.log, where *IDNumber* is a system-generated number for your log.

8   **Manually remove any remaining files or directories.**

9   **For Windows systems, check the Windows registry for any remaining keys ending with** OpenDS**. For example:**

```
SYSTEM\\CurrentControlSet\\Services\\EventLog\\Application\\OpenDS
```

10 **Locate the** SunOpenDS_SE2.2 **directory, and manually remove the directory and its subdirectories.**

```
(UNIX, Linux) $ rm -ir SunOpenDS_SE2.2
(Windows)     C:\> rmdir /s /q C:\path\to\SunOpenDS_SE2.2
```

▼ To Uninstall the Directory Server Using the CLI

You can uninstall the directory server in interactive, command-line mode by typing uninstall --cli. In interactive mode, you are prompted for any required input.

1   **Go to the Sun OpenDS Standard Edition installation subdirectory.**

2   **Use the** uninstall **command with the** --cli **option.**

```
(UNIX, Linux) $ uninstall --cli
(Windows)     C:\> uninstall.bat --cli
```

3   **Select the components to be removed.**

▪   **To remove all components, press Enter or Return to accept the default.**

```
Do you want to remove all components of OpenDS or select the components to
remove?
```

```
1)  Remove all components
2)  Select the components to be removed

q)  quit
```

Enter choice [1]:

- **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.

4 **If your directory 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.

```
This server is configured to do replication.
If the server is actually replicating contents with other servers you must
provide administrator authentication to remove references to this server in
the replicating OpenDS servers.

Type 'Yes' to provide authentication to remove the remote references.
Type 'No' to continue the uninstall without updating remote references.
Provide authentication? (yes / no) [yes]:
# Type your Global Administrator user ID, password, and host of the directory server
as it is referenced in other replication servers.
Global Administrator User ID [admin]:

Password for user 'admin':

The name of this host (or IP address) as it is referenced in remote servers
for replication [sr1-uaus-01]:
```

5 **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).

```
The OpenDS server is currently running and must be stopped before
uninstallation can continue.
Stop the Server and permanently delete the files? (yes / no) [yes]:

Stopping Directory Server ..... Done.
Deleting Files under the Installation Path ..... Done.

OpenDS Uninstall Completed Successfully.
To complete the uninstallation, you must delete manually the following files
```

```
and directories:
/home/sunopends/standalone/ds-server-test/lib

See /var/tmp/opends-uninstall-16565.log for a detailed log of this operation.
```

6 **If you want to quit the uninstaller without removing files, type** q**.**

The uninstall quits the process and logs the entry.

Note – UNIX logs the entry at /var/tmp, Linux at /tmp, and Windows at the location defined by the TEMP user environment variable.

```
(UNIX, Linux) $ uninstall --cli
(Windows)      C:\> uninstall.bat --cli
Do you want to remove all components of OpenDS or select the components to
remove?

    1)  Remove all components
    2)  Select the components to be removed

    q)  quit

Enter choice [1]:

See /var/tmp/opends-uninstall-24340.log for a detailed log of this operation.
```

7 **Check that all files and directories have been removed. If they have not been removed, manually remove them.**

8 **For Windows systems, check the Windows registry for any remaining keys ending with** OpenDS**.**

For example:

```
SYSTEM\\CurrentControlSet\\Services\\EventLog\\Application\\OpenDS
```

9 **Locate the** SunOpenDS_SE2.2 **directory, and manually remove the directory and its subdirectories.**

```
(UNIX, Linux) $ rm -ir SunOpenDS_SE2.2
(Windows)      C:\> rmdir /s /q C:\path\to\SunOpenDS_SE2.2
```

▼ **To Uninstall the Directory Server by Using a Script (UNIX/Linux Only)**

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.

```
install-dir/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.

Uninstalling the Proxy

The following section describes how to uninstall a Sun OpenDS Standard Edition proxy using `vdp-uninstall`.

Note – The `vdp-uninstall` command does not uninstall any of the Sun OpenDS Standard Edition directory servers that you may be accessing with the Sun OpenDS Standard Edition proxy. To uninstall a Sun OpenDS Standard Edition directory server, see "Uninstalling the Directory Server" on page 61.

Uninstalling the Sun OpenDS Standard Edition proxy will stop the proxy if the proxy is running, and remove all or part of the proxy installation files and directories, as well as global index replication, if configured.

You can uninstall the Sun OpenDS Standard Edition proxy using one of the following modes:

- **Graphical user interface (GUI) mode**. See "To Uninstall the Proxy Using `vdp-uninstall` GUI" on page 67.
- **Interactive command-line mode**. See "To Uninstall the Proxy Using the CLI" on page 68.
- **Quiet uninstall mode**. "To Uninstall by Using the CLI with No Prompt" on page 69.

For more information about the `vdp-uninstall` command, see "vdp-uninstall" in *Sun OpenDS Standard Edition 2.2 Command-Line Usage Guide*.

▼ To Uninstall the Proxy Using `vdp-uninstall` GUI

GUI mode is the default and recommended uninstall option. The GUI provides an easy interface for removing a directory server installation.

1   Go to the Sun OpenDS Standard Edition installation directory.

2   Type `vdp-uninstall` to launch the graphical uninstaller.
```
(UNIX, Linux) $ vdp-uninstall
(Windows) C:\> vdp-uninstall.bat
```

3 Check that the path of your proxy installation is correct.

If the path is not the path of the Sun OpenDS Standard Edition proxy that you wish to uninstall, then vdp-uninstall has been launched from the wrong installation directory.

4 Leave all the items you want to uninstall selected.

***

Note – Even if you choose to remove all the components, the lib directory will not be removed. You must remove the lib directory manually.

***

5 Click Uninstall.

6 Confirm that you want to stop the server.

▼ To Uninstall the Proxy Using the CLI

Interactive command-line mode prompts the user for required information before the uninstall begins and is started by using the --cli option. If uninstall --cli requires more input, then the uninstall utility prompts the user for the input and does not exit.

1 Go to the Sun OpenDS Standard Edition installation subdirectory.

***

Note – It is recommended to stop the Sun OpenDS Standard Edition proxy when uninstalling the components.

***

2 At the command line prompt, enter:
```
(UNIX, Linus) $ vdp-uninstall --cli
(Windows) C:\> vdp-uninstall.bat --cli
```

3 Select the components to be removed.

- **To remove all components, press Enter or Return to accept the default.**
  ```
  Do you want to remove all components of OpenDS or select the components to
  remove?

      1)  Remove all components
      2)  Select the components to be removed

      q)  quit

  Enter choice [1]:
  ```

■ **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.

4   Check that all files and directories have been removed. If they have not been removed, manually remove them.

▼ To Uninstall by Using the CLI with No Prompt

You can uninstall your Sun OpenDS Standard Edition proxy using the command line, but without being prompted in interactive mode. Quiet uninstall mode suppresses progress information to standard output, except for fatal errors. This mode is convenient for scripting with the --no-prompt and --quiet options.

1   Go to the top level of the Sun OpenDS Standard Edition proxy directory.

2   At the command line prompt, enter:

```
$ vdp-uninstall --cli --remove-all -Q -n
```

Note – The lib directory is not removed. You must remove the lib directory manually.