

Installation Guide

Novell® eDirectory™

8.8 SP6

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About This Book

This Installation Guide describes how to install Novell eDirectory 8.8. It is intended for network administrators, and contains the following sections:

- ♦ Chapter 1, “Installing or Upgrading Novell eDirectory on Linux,” on page 9
- ♦ Chapter 4, “Installing or Upgrading Novell eDirectory on Windows,” on page 71
- ♦ Chapter 2, “Installing or Upgrading Novell eDirectory on Solaris,” on page 39
- ♦ Chapter 3, “Installing or Upgrading Novell eDirectory on AIX,” on page 57
- ♦ Chapter 5, “Relocating the DIB,” on page 93
- ♦ Chapter 6, “Upgrade Requirements of eDirectory 8.8,” on page 95
- ♦ Chapter 7, “Configuring Novell eDirectory on Linux, Solaris, or AIX Systems,” on page 101
- ♦ Chapter 10, “Uninstalling Novell eDirectory,” on page 117
- ♦ Chapter 11, “eDirectory Instrumentation,” on page 125
- ♦ Appendix A, “Linux, Solaris, and AIX Packages for Novell eDirectory,” on page 133
- ♦ Appendix B, “eDirectory Health Checks,” on page 137
- ♦ Appendix C, “Configuring OpenSLP for eDirectory,” on page 143

Audience

The guide is intended for network administrators.

Feedback

We want to hear your comments and suggestions about this manual and the other documentation included with this product. Please use the User Comments feature at the bottom of each page of the online documentation, or go to www.novell.com/documentation/feedback.html and enter your comments there.

Documentation Updates

For the most recent version of the *Novell eDirectory 8.8 Installation Guide*, see the [Novell eDirectory 8.8 Documentation \(http://www.novell.com/documentation/edir88/index.html\)](http://www.novell.com/documentation/edir88/index.html) Web site.

Additional Documentation

For documentation on managing and administering eDirectory, see the *Novell eDirectory 8.8 Administration Guide* (<http://www.novell.com/documentation/edir88/index.html>).

Also, you might be interested in reading *Novell eDirectory 8.8 SP6 Readme Addendum* (<http://www.novell.com/support/viewContent.do?externalId=7003468>).

Installing or Upgrading Novell eDirectory on Linux

1

Use the following information to install or upgrade Novell eDirectory 8.8 on a Linux server:

- ♦ [Section 1.1, “System Requirements,” on page 9](#)
- ♦ [Section 1.2, “Prerequisites,” on page 10](#)
- ♦ [Section 1.3, “Hardware Requirements,” on page 12](#)
- ♦ [Section 1.4, “Forcing the Backlink Process to Run,” on page 13](#)
- ♦ [Section 1.5, “Upgrading eDirectory,” on page 13](#)
- ♦ [Section 1.6, “Installing eDirectory,” on page 19](#)

1.1 System Requirements

❑ One of the following:

For a 32-bit eDirectory installation:

- ♦ 32-bit
 - ♦ SUSE Linux Enterprise Server (SLES) 11 and its Support Packs
 - ♦ SLES 10 and its Support Packs

NOTE: You might get a warning message while installing eDirectory 8.8SP6 on SLES 10 SP3. Ignore this warning message. For more information, see [TID 7005524](http://www.novell.com/support/php/search.do?cmd=displayKC&docType=kc&externalId=7005524) (<http://www.novell.com/support/php/search.do?cmd=displayKC&docType=kc&externalId=7005524>)

- ♦ Red Hat Enterprise Linux (RHEL) 5 AP and its Support Packs
- ♦ RHEL 6.0 and its Support Packs
- ♦ RHEL virtualization (5.0 and 6.0)
- ♦ XEN (on SLES 10 and SLES 11 and their Support Packs)
- ♦ VMWare ESX
- ♦ 64-bit
 - ♦ SLES 11 and its Support Packs
 - ♦ SLES 10 and its Support Packs
 - ♦ RHEL 5 AP and its Support Packs
 - ♦ RHEL 6.0 and its Support Packs
 - ♦ RHEL virtualization (5.0 and 6.0)
 - ♦ VMWare ESX
 - ♦ XEN (on SLES 10 and SLES 11 and their Support Packs)

NOTE: eDirectory 8.8 SP6 is supported on SLES 10 XEN virtualization service that runs the SLES 10 guest OS. The following updates are available at <https://update.novell.com> (<https://update.novell.com>).

- ♦ SUSE-Linux-Enterprise-Server-X86_64-10-0-20061011-020434

- ♦ SLES10-Updates

For registering and updating SUSE Linux Enterprise 10, refer to [Registering SUSE Linux Enterprise 10 with the Novell Customer Center](http://support.novell.com/techcenter/articles/RegandUpdate_SLE10.html) (http://support.novell.com/techcenter/articles/RegandUpdate_SLE10.html). After installing the latest update, ensure that the minimum patch level of the installed update is 3.0.2_09763-0.8.

To determine the version of SUSE Linux you are running, see the /etc/SuSE-release file.

Ensure that the latest glibc patches are applied from [Red Hat Errata](http://rhn.redhat.com/errata) (<http://rhn.redhat.com/errata>) on Red Hat systems. The minimum required version of the glibc library is version 2.1.

For a 64-bit eDirectory installation:

- ♦ SLES 11 64-bit and its Support Packs
- ♦ SLES 10 64-bit and its Support Packs
- ♦ RHEL 5 AP and its Support Packs
- ♦ RHEL 6.0 and its Support Packs
- ♦ VMWare ESX
- ♦ RHEL virtualization (5.0 and 6.0)
- ♦ XEN (on SLES 10 and SLES 11 and their Support Packs)

- ☐ A minimum of 512 MB RAM for eDirectory
- ☐ 162 MB of disk space for the eDirectory server
- ☐ 30 MB of disk space for the eDirectory administration utilities
- ☐ 150 MB of disk space for every 50,000 users
- ☐ Ensure that gettext is installed

NOTE: By default, gettext is not installed; ensure you install it before you run nds-install, or you will get messages about it being missing. On SLES, gettext is available in install CDs.

-
- ☐ Ensure that net-snmp-32-bit RPM is installed on 64-bit SLES or OES Linux. The RPM is available in the SLES 10 64bit install CD.
 - ☐ If you use ZLM for patch management, apply the hotpatch ZLM6.6.2 HP4 before upgrading to eDirectory 8.8 SP6. On servers such as Vanilla SLES10 or SLES10 SP1, libredcarpet should be upgraded to the latest patch level using Yast Online Update.

1.2 Prerequisites

IMPORTANT: Check the currently installed Novell and Third Party applications to determine if eDirectory 8.8 is supported before upgrading your existing eDirectory environment. You can find out the current status for Novell products in the [TID - What Novell products are supported with Novell eDirectory 8.8?](http://www.novell.com/support/php/) (<http://www.novell.com/support/php/>)

search.do?cmd=displayKC&docType=kc&externalId=7003446&sliceId=1&docTypeID=DT_TID_1_1&dialogID=65754231&stateId=0%200%2065752376). It is highly recommended to back up eDirectory before any upgrades.

- ❑ (Conditional) NICI 2.7 and eDirectory 8.8 support key sizes up to 4096 bits. If you want to use a 4 KB key size, every server must be upgraded to eDirectory 8.8. In addition, every workstation using the management utilities, for example, iManager and ConsoleOne, must have NICI 2.7 installed on it.

When you upgrade your Certificate Authority (CA) server to eDirectory 8.8, the key size will not change; it will be 2 KB. The only way to create a 4 KB key size is recreate the CA on an eDirectory 8.8 server. In addition, you would have to change the default from 2 KB to 4 KB for the key size, during the CA creation.

For more information, refer to [“Installing NICI” on page 23](#).

- ❑ SLP installed and configured

With eDirectory 8.8, SLP does not get installed as part of the eDirectory installation.

Only a root user can install SLP.

For more information on installing SLP, refer to [“Using SLP with eDirectory” on page 19](#).

- ❑ The Linux host enabled for multicast routing

To check if the host is enabled for multicast routing, enter the following command:

```
/bin/netstat -nr
```

The following entry should be present in the routing table:

```
224.0.0.0 0.0.0.0
```

If the entry is not present, log in as root and enter the following command to enable multicast routing:

```
route add -net 224.0.0.0 netmask 240.0.0.0 dev interface
```

The *interface* could be a value such as eth0, hme0, hme1, or hme2, depending on the NIC that is installed and used.

For more information on multicast and broadcast routes, refer to the [Open SLP User Guide \(http://www.openslp.org/doc/html/UsersGuide/Installation.html\)](http://www.openslp.org/doc/html/UsersGuide/Installation.html).

- ❑ Network server time synchronized

Use Network Time Protocol's (NTP) xntpd to synchronize time across all network servers.

- ❑ compat-libstdc++ RPM

If the compat-libstdc++ RPM is not present on your host machine, install it. This RPM contains libstdc++-libc6.1-1.so.2.

- ❑ (Conditional) compat-libstdc++-33-3.2.3-61.i386.rpm

If you are installing eDirectory on RHEL5.0, install compat-libstdc++-33-3.2.3-61.i386.rpm.

- ❑ compat

If the compat RPM is not present on your machine, install it. This RPM or the ncurses contains libncurses.so.4.x or libncurses.so.5.x. eDirectory 8.8 supports libncurses.so.4.x and libncurses.so.5.x.

- ❑ For YaST based installation:
 - ♦ Install the `java 1_4_2 jre` package. This contains `libjava.so` and `libjvm.so`.
- ❑ (Conditional) If you are installing a secondary server, all the replicas in the partition that you install the product on should be in the On state.
- ❑ (Conditional) If you are installing a secondary server into an existing tree as a nonadministrator user, create a container and then partition it. Ensure that you have the following rights:
 - ♦ Supervisor rights to this partition.
 - ♦ All Attributes rights: read, compare, and write rights over the `W0.KAP.Security` object.
 - ♦ Entry rights: browse rights over Security container object.
 - ♦ All Attributes rights: read and compare rights over Security container object.
- ❑ (Conditional) If you are installing a secondary server into an existing tree as a nonadministrator user, ensure that at least one of the servers in the tree has the same or higher eDirectory version as that of the secondary being added as container admin. In case the secondary being added is of later version, then the schema needs to be extended by the admin of the tree before adding the secondary using container admin.
- ❑ While configuring eDirectory, you must enable SLP services and an NCP™ port (the default is 524) in the firewall to allow the secondary server addition. Additionally, you can enable the following service ports based on your requirements:
 - ♦ LDAP clear text - 389
 - ♦ LDAP secured - 636
 - ♦ HTTP clear text - 8028
 - ♦ HTTP secured - 8030

In case, if you have enabled user-defined ports, you must mention these ports while configuring eDirectory.
- ❑ Do not set the user-defined ports to 8008 and 8010 while upgrading eDirectory 882 or later versions to 886. If the ports are set to 8008 or 8010, `ndsconfig` assumes that the server is a pre-eDirectory 8.8x server and automatically resets them to 8028 and 8030 respectively.
- ❑ During eDirectory upgrade, if SecretStore has not already been configured with the previous versions, or you do not want to configure SecretStore, use the `-m no_ss` option with the `nds-install` utility.

Configuring Static IP Address

Static IP address must be configured on the server for the eDirectory to perform efficiently. Configuring eDirectory on the servers with DHCP address can lead to unpredictable results.

1.3 Hardware Requirements

Hardware requirements depend on the specific implementation of eDirectory. Two factors increase performance: more cache memory and faster processors. For best results, cache as much of the DIB Set as the hardware allows.

eDirectory scales well on a single processor. However, Novell eDirectory 8.8 takes advantage of multiple processors. Adding processors improves performance in some areas — for example, logins — and having multiple threads active on multiple processors also improves performance. eDirectory itself is not processor intensive, but it is I/O intensive.

The following table illustrates typical system requirements for eDirectory for Linux:

Objects	Processor	Memory	Hard Disk
100,000	Pentium III 450-700 MHz (single)	384 MB	144 MB
1 million	Pentium III 450-700 MHz (dual)	2 GB	1.5 GB
10 million	Pentium III 450-700 MHz (2 to 4)	2+ GB	15 GB

Requirements for processors might be greater than the table indicates, depending upon additional services available on the computer as well as the number of authentications, reads, and writes that the computer is handling. Processes such as encryption and indexing can be processor intensive.

1.4 Forcing the Backlink Process to Run

Because the internal eDirectory identifiers change when upgrading to Novell eDirectory, the backlink process must update backlinked objects for them to be consistent.

Backlinks keep track of external references to objects on other servers. For each external reference on a server, the backlink process ensures that the real object exists in the correct location and verifies all backlink attributes on the master of the replica. The backlink process occurs two hours after the database is open, and then every 780 minutes (13 hours). The interval is configurable from 2 minutes to 10,080 minutes (7 days).

After migrating to eDirectory, start the ndstrace process by issuing the `ndstrace -l>log&` command, which runs the process at the background. This allows you to properly analyze the results of the backlinker process, which takes 4 to 10 minutes. Then force the backlink process to run by issuing the `ndstrace -c 'set ndstrace=*B'` command from the ndstrace OS command prompt. Review the results of the log file created in the first step. Then you can unload the ndstrace process by issuing the `ndstrace -u` command. Running the backlink process is especially important on servers that do not contain a replica.

1.5 Upgrading eDirectory

- ♦ [Section 1.5.1, “Server Health Checks,” on page 14](#)
- ♦ [Section 1.5.2, “Upgrading on Linux Servers Other Than OES,” on page 14](#)
- ♦ [Section 1.5.3, “Unattended Upgrade of eDirectory on Unix,” on page 15](#)
- ♦ [Section 1.5.4, “Upgrading eDirectory on Existing OES,” on page 16](#)
- ♦ [Section 1.5.5, “Upgrading eDirectory During OES 1.0 to OES 2.0 Upgrade,” on page 16](#)
- ♦ [Section 1.5.6, “Upgrading the Tarball Deployment of eDirectory 8.8,” on page 16](#)
- ♦ [Section 1.5.7, “Upgrading Multiple Instances,” on page 18](#)
- ♦ [Section 1.5.8, “Disk Space Check on Upgrading to eDirectory 8.8 SP6,” on page 18](#)

IMPORTANT: Ensure that supported version of SSP is installed on eDirectory 873 SPx before upgrading to eDirectory 8.8 SP6.

- ♦ For eDirectory 873 SP9, ensure that SSP 203 is installed.
 - ♦ For eDirectory 873 SP10, ensure that SSP 206 is installed.
-

NOTE: ndsconfig upgrade is used to upgrade the necessary configuration of the individual components such as HTTP, LDAP, SNMP, SAS, and NMAS. eDirectory database is upgraded to a new format if eDirectory versions prior to eDirectory 8.8 SP1 are upgraded to eDirectory 8.8 SP6.

1.5.1 Server Health Checks

With eDirectory 8.8, when you upgrade eDirectory, a server health check is conducted by default to ensure that the server is safe for the upgrade:

- ♦ [Section B.3.2, “Partitions and Replica Health,” on page 139](#)

Based on the results obtained from the health checks, the upgrade will either continue or exit as follows:

- ♦ If all the health checks are successful, the upgrade will continue.
- ♦ If there are minor errors, the upgrade will prompt you to continue or exit.
- ♦ If there are critical errors, the upgrade will exit.

See [Appendix B, “eDirectory Health Checks,” on page 137](#) for a list of minor and critical error conditions.

Skipping Server Health Checks

To skip server health checks, use `nds-install -j` or `ndsconfig upgrade -j`.

For more information, see [Appendix B, “eDirectory Health Checks,” on page 137](#).

1.5.2 Upgrading on Linux Servers Other Than OES

If you have eDirectory 8.5.x or 8.6.x, you have to first upgrade to eDirectory 8.7.x and then upgrade to eDirectory 8.8.

To upgrade to eDirectory 8.8, use `nds-install` utility. this utility is located in the Setup directory of the downloaded file for Linux platform. Enter the following command from Setup directory:

```
./nds-install
```

After the upgrade to eDirectory 8.8, the default location of the configuration files, data files, and log files are changed to `/etc/opt/novell/eDirectory/conf`, `/var/opt/novell/eDirectory/data`, and `/var/opt/novell/eDirectory/log` respectively.

The new directory `/var/opt/novell/eDirectory/data` uses a symbolic link to the `/var/nds` directory.

The old configuration file `/etc/nds.conf` is migrated to `/etc/opt/novell/eDirectory/conf` directory. The old configuration file `/etc/nds.conf` and the old log files under `/var/nds` are retained for reference.

NOTE: Run "ndsconfig upgrade" after `nds-install`, if upgrade of the DIB fails and `nds-install` asks to do so.

NOTE: Health check fails due to time sync. To resolve this issue, perform a time sync between the instances. You can ignore this warning message during upgrade.

1.5.3 Unattended Upgrade of eDirectory on Unix

On UNIX platform, eDirectory provides switches and options along with the install script and configuration utility that facilitates the unattended upgrade. The following sections discuss various steps for unattended eDirectory upgrade on UNIX:

1 Perform the health check of eDirectory:

Health check of all the root instances planned for upgrade is manually done by using `ndsccheck` utility.

1a export `LD_LIBRARY_PATH`, `SHLIB_PATH` and `LIBPATH` to the <untarred location of eDirectory>/eDirectory/setup/Utils

1b Run `ndsccheck` using one of the below commands:

```
<untarred location of eDirectory>/eDirectory/setup/Utils/ndsccheck -a  
<user name> -w passwd --config-file <nds.conf with absolute path>
```

Passing the password through environment variable: <untarred location of 88SP6>/eDirectory/setup/Utils/ndsccheck -a <user name> -w
env:<environment variable> --config-file <nds.conf with absolute path>

Passing the password through file: <untarred location of 88SP6>/eDirectory/
setup/Utils/ndsccheck -a <user name> -w file:<filename> --config-file
<nds.conf with absolute path>

Any one of the above can be used in the automated script for the health check. For example:

```
/Builds/eDirectory/Utils/ndsccheck -a admin.novell -w n  
/Builds/eDirectory/Utils/ndsccheck -a admin.novell -w env:ADM_PASWD  
/Builds/eDirectory/Utils/ndsccheck -a admin.novell -w file:adm_passwd
```

2 Upgrade the eDirectory 8.8 packages:

2a Run `nds-install` script to upgrade the packages as below:

```
nds-install -u -i -j
```

3 Update the following environment variables :

```
PATH=/opt/novell/eDirectory/bin:/opt/novell/eDirectory/sbin:$PATH  
LD_LIBRARY_PATH=/opt/novell/eDirectory/lib:/opt/novell/eDirectory/lib/  
nds-modules:/opt/novell/lib:$LD_LIBRARY_PATH  
MANPATH=/opt/novell/man:/opt/novell/eDirectory/man:$MANPATH  
TEXTDOMAINDIR=/opt/novell/eDirectory/share/locale
```

4 Upgrade eDirectory by using the `ndsconfig` utility for all the root instances by using the following commands:

```
ndsconfig upgrade -a <user name> -w passwd -c --config-file <nds.conf with  
absolute path>
```

Passing the password through environment variable: `ndsconfig upgrade -a <user name> -w env:<environment variable> -c --config-file <nds.conf with absolute path>`

Passing the password through file: `ndsconfig upgrade -a <user name> -w file:<filename with absolute/relative path> -c --config-file <nds.conf with absolute path>`

Any of the above can be used in the automated script for the eDirectory upgrade. For example:

```
ndsconfig upgrade -a admin.novell -w n -c --config-file /etc/opt/novell/
eDirectory/conf/nds.conf

ndsconfig upgrade -a admin.novell -w env:ADM_PASWD -c --config-file /etc/
opt/novell/eDirectory/conf/nds.conf

ndsconfig upgrade -a admin.novell -w file:/Builds/88SP6/adm_paswd -c --
config-file /etc/opt/novell/eDirectory/conf/nds.conf
```

1.5.4 Upgrading eDirectory on Existing OES

For more information on upgrading eDirectory on existing OES, refer to the [OES Linux Installation Guide](http://www.novell.com/documentation/oes2/inst_oes_lx/index.html?page=/documentation/oes2/inst_oes_lx/data/bxlu3xc.html#bxlu3xc) (http://www.novell.com/documentation/oes2/inst_oes_lx/index.html?page=/documentation/oes2/inst_oes_lx/data/bxlu3xc.html#bxlu3xc).

1.5.5 Upgrading eDirectory During OES 1.0 to OES 2.0 Upgrade

eDirectory should be upgraded when OES upgrades from OES 1.0 to OES 2.0. For more information on OES upgrade, refer to [OES Linux Installation Guide](http://www.novell.com/documentation/oes/install_linux/data/bujr8yu.html) (http://www.novell.com/documentation/oes/install_linux/data/bujr8yu.html).

Perform the following checks before upgrading the OES or eDirectory server:

- ♦ eDirectory Health Check

Ensure that eDirectory health status is normal using the procedures specified in [Appendix B, “eDirectory Health Checks,”](#) on page 137. You can use the applicable tools for verification:

- ♦ Use iMonitor for eDirectory version prior to 8.8, see [Using Novell iMonitor 2.4](http://www.novell.com/documentation/edir88/edir88/data/acavuul.html#a6160fc) (<http://www.novell.com/documentation/edir88/edir88/data/acavuul.html#a6160fc>) from *Novell eDirectory 8.8 Administration Guide*.
- ♦ Use ndscheck utility for eDirectory version 8.8 or later, see [General Utilities](http://www.novell.com/documentation/edir88/edir88/data/b9jto4d.html) (<http://www.novell.com/documentation/edir88/edir88/data/b9jto4d.html>) from *Novell eDirectory 8.8 Administration Guide*.
- ♦ Disk Space Check

For eDirectory version prior to 8.8 SP1, ensure disk space available on the file system that holds the DIB at least equals the DIB size. For example, if the DIB size is 100 MB, the available disk space should not be less than 100 MB.

If the eDirectory health status is not normal or an error is detected, refer to the [Section B.5, “Log Files,”](#) on page 141.

1.5.6 Upgrading the Tarball Deployment of eDirectory 8.8

If you want to upgrade the Tarball deployment from eDirectory 8.8 to eDirectory 8.8 SP6, perform the following steps:

- 1 Download the tarball build.

2 Take backup of the following configuration files:

- ♦ \$NDSHOME/eDirectory/etc/opt/novell/eDirectory/conf/ndsimon.conf
- ♦ \$NDSHOME/eDirectory/etc/opt/novell/eDirectory/conf/ice.conf
- ♦ \$NDSHOME/eDirectory/etc/opt/novell/eDirectory/conf/ndsimonhealth.conf
- ♦ \$NDSHOME/eDirectory/etc/opt/novell/eDirectory/conf/ndssnmp/ndssnmp.cfg
- ♦ \$NDSHOME is the location where eDirectory is installed.

3 For upgrade of eDirectory versions lower than 8.8 SP1, do the following:

- ♦ Perform disk space check using `ndsccheck -D --config-file conf_file_path`
- ♦ Create an empty file `upgradedDIB` under the DIB location of each server instance.

The list of instances can be obtained using the `ndsmanage` utility.

4 Run pre upgrade health check for the all instances using `ndsccheck` and check the `ndsccheck.log` file for any errors before proceeding with the upgrade.

5 Stop all instances using `ndsmanage`.

6 Untar the tarball in the same location (\$NDSHOME) where eDirectory is installed. By untaring the tarball in the same location, you are overwriting the binaries and libraries.

7 Upgrade the following packages if necessary.

Platform	Command	Packages
Linux 32-bit	♦ <code>rpm -Uvh <rpm name></code>	♦ novell-NOVLsubag-8.8.6-1.i586.rpm ♦ novell-NDSslp-8.8.2-1.i386.rpm ♦ nici-2.7.0-0.01.i386.rpm ♦ novell-NDSslp-8.8-1.i386.rpm
Linux 64-bit		♦ novell-NOVLsubag-8.8.6-1.x86_64.rpm ♦ nici64-2.7.6-0.01.x86_64.rpm NOTE: For more information on installing 32 and 64-bit NICI, refer to the "Installing NICI" on page 23 .
Solaris 32-bit	♦ Remove the older version using " <code>pkgrm <pkg name></code> " ♦ Install new version using " <code>pkgadd -d <pkg name></code> "	♦ NOVLsubag.pkg ♦ NOVLniu0.pkg ♦ NDSslp.pkg
Solaris 64-bit		♦ NOVLsubagx.pkg ♦ NOVLniu64.pkg
AIX	♦ <code>installp -acgXd <pkg name with full path> <pkg name> all</code>	♦ NDS.NOVLsubag.8.8.6.0 ♦ NOVLniu0.2.7.6.0 ♦ NDS.NDSslp.8.8.2.0

- 8 Restore the configuration files.
- 9 Run the `$NDSHOME/eDirectory/opt/novell/eDirectory/bin/ndspath` for setting all environment variables.
- 10 Run `ndsconfig upgrade -j` for all instances. While running `ndsconfig upgrade` follow the order in which the master replica is the first and followed by Read/Write and others.

1.5.7 Upgrading Multiple Instances

This section contains the following information:

- ♦ “Root User has Multiple Instances” on page 18
- ♦ “Non Root User’s Instances” on page 18
- ♦ “Order of Upgrade” on page 18

Root User has Multiple Instances

If you run `nds-install` after upgrading the package, it prompts you to upgrade the DIB files of all the eDirectory server instances, which might take a long time to complete. If you wish to perform the DIB upgrade parallelly, you can do it manually (Refer to the [eDirectory Readme \(http://www.novell.com/documentation/edir88/edir886_unix_readme/data/edir886_unix_readme.html\)](http://www.novell.com/documentation/edir88/edir886_unix_readme/data/edir886_unix_readme.html)). If you select to upgrade the DIB for all the active instances one by one, it runs the `ndsconfig upgrade` command for all the instances one by one. In case of larger DIBs, you can select *No* and run `ndsconfig upgrade` parallelly in separate shells, which can reduce the upgrade time of each instance.

Non Root User's Instances

If you have non root user's instances which are using root user's binaries, before doing the package upgrade you need to run “`ndsccheck`” for such instances and make sure that their health is proper by referring the `ndsccheck.log` file. If you run `nds-install`, it stops all the instances including the non root user's instances. After doing the package upgrade, the `nds-install` command does not call `ndsconfig upgrade` for non root user's instances. You need to manually run `ndsconfig upgrade` for all non root user's instances to start these instances.

Order of Upgrade

While running `ndsconfig upgrade`, it is recommended to follow the order in which master replica comes first and then Read/Write or other replicas.

1.5.8 Disk Space Check on Upgrading to eDirectory 8.8 SP6

When eDirectory server is upgraded from previous versions to eDirectory 8.8 SP6, the disk space check for the DIB upgrade would be performed. The free disk space necessary in the file system, where the DIB resides would be equal to that of the DIB size. The messages of the disk space check would be updated in the `ndsccheck.log` located in the instance's specific log directory. For default instance, `/var/opt/novell/eDirectory/log/ndsccheck.log`.

NOTE: The disk space check is required only during the DIB upgrade process. For more information, refer to [Chapter 6, “Upgrade Requirements of eDirectory 8.8,” on page 95](#).

1.6 Installing eDirectory

The following sections provide information about installing Novell eDirectory on Linux:

- ♦ [Section 1.6.1, “Using SLP with eDirectory,” on page 19](#)
- ♦ [Section 1.6.2, “Using the nds-install Utility to Install eDirectory Components,” on page 20](#)
- ♦ [Section 1.6.3, “Nonroot User Installing eDirectory 8.8,” on page 23](#)
- ♦ [Section 1.6.4, “Using the ndsconfig Utility to Add or Remove the eDirectory Replica Server,” on page 26](#)
- ♦ [Section 1.6.5, “Using ndsconfig to Configure Multiple Instances of eDirectory 8.8,” on page 31](#)
- ♦ [Section 1.6.6, “Using ndsconfig to Install a Linux Server into a Tree with Dotted Name Containers,” on page 37](#)
- ♦ [Section 1.6.7, “Using the nmasinst Utility to Configure NMAS,” on page 37](#)
- ♦ [Section 1.6.8, “Nonroot user SNMP configuration,” on page 38](#)

1.6.1 Using SLP with eDirectory

In earlier releases of eDirectory, SLP was installed during the eDirectory install. But with eDirectory 8.8, you need to separately install SLP before proceeding with the eDirectory install.

If you plan to use SLP to resolve tree names, it should have been properly installed and configured and the SLP DAs should be stable.

- 1 Install OpenSLP (if it is not installed already)
- 2 Follow the onscreen instructions to complete the SLP installation.
- 3 Start SLP manually as follows:

```
/etc/init.d/slpd start
```

For more information, refer to [Appendix C, “Configuring OpenSLP for eDirectory,” on page 143](#).

Similarly, when you uninstall the SLP package, you need to stop SLP manually, as follows:

```
/etc/init.d/slpd stop
```

If you don't want to (or cannot) use SLP, you can use the flat file `hosts.nds` to resolve tree names to server referrals. The `hosts.nds` file can be used to avoid SLP multicast delays when SLP DA is not present in the network.

`hosts.nds` is a static lookup table used by eDirectory applications to search eDirectory partition and servers. In the `hosts.nds` file, for each tree or server, a single line contains the following information:

- ♦ Tree/Server Name: Tree names end with a trailing dot (.).
- ♦ Internet Address: This can be a DNS name or IP address.
- ♦ Server Port: Optional, appended with a colon (:) to the Internet address.

Local server need not have an entry in this file unless it is listening on non-default ncp port.

The syntax followed in the `hosts.nds` file is as follows:

```
<[partition name.]tree name>. <host-name/ip-addr>[:<port>]  
<server name> <dns-addr/ip-addr>[:<port>]
```

For example:

```
# This is an example of a hosts.nds file:  
# Tree name          Internet address/DNS Resolvable Name  
  CORPORATE.         myserver.mycompany.com  
  novell.CORPORATE.   1.2.3.4:524  
  
# Server name        Internet address  
  CORPSERVER         myserver.mycompany.com
```

See the `hosts.nds` man page for more details.

If you decide to use SLP to resolve the tree name to determine if the eDirectory tree is advertised, after eDirectory and SLP are installed, enter the following:

```
/usr/bin/slptool findattrs services:ndap.novell///(svcname-ws==[treename or  
*])"
```

For example, to search for the services whose `svcname-ws` attribute match with the value `SAMPLE_TREE`, enter the following command:

```
/usr/bin/slptool findattrs services:ndap.novell///(svcname-ws==SAMPLE_TREE)/"
```

If you have a service registered with its `svcname-ws` attribute as `SAMPLE_TREE`, then the output will be similar to the following:

```
service:ndap.novell:///SAMPLE_TREE
```

If you do not have a service registered with its `svcname-ws` attribute as `SAMPLE_TREE`, there will be no output.

For more information, see [Appendix C, “Configuring OpenSLP for eDirectory,” on page 143](#).

1.6.2 Using the `nds-install` Utility to Install eDirectory Components

Use the `nds-install` utility to install eDirectory components on Linux systems. This utility is located in the `Setup` directory of the downloaded file for the Linux platform. The utility adds the required packages based on what components you choose to install.

IMPORTANT: If the ZENworks Linux Management client is installed and the daemon (`rcd`) is running, then before running `nds-install`, stop the daemon using `/etc/init.d/rcd stop`.

- 1 Enter the following command at the setup directory:

```
./nds-install
```

If you do not provide the required parameters in the command line, the `nds-install` utility will prompt you for the parameters.

The following table provides a description of the `nds-install` utility parameters:

nds-install Parameter	Description
-h or --help	Displays help for nds-install.
-i	Prevents the nds-install script from invoking the ndsconfig upgrade if a DIB is detected at the time of the upgrade.
-j	Jumps or overrides the health check option before installing eDirectory. For more information about health checks, refer to Appendix B, "eDirectory Health Checks," on page 137 .
-m	Specifies the module name to configure. While configuring a new tree, you can configure only the ds module. After configuring the ds module, you can add the NMAS, LDAP, SAS, SNMP, HTTP services, and Novell SecretStore (ss) using the add command. If the module name is not specified, all the modules are installed.
-u	Specifies the option to use in an unattended install mode. For unattended install to proceed, you need to enter at least the -c option at the command line, or else the install will abort.

The installation program installs the following RPMs:

eDirectory Component	Packages Installed	Description
eDirectory Server	novell-NDSbase novell-NDScommon novell-NDSmasv novell-NDSserv novell-NDSimon novell-NDSrepair novell-NDSdextvnt novell-NOVLsubag novell-NOVLsnmp novell-NOVLpkit novell-NOVLpkis novell-NOVLpkia novell-NOVLembox novell-NOVLimgnt novell-NOVLxis novell-NLDAPsdk novell-NLDAPbase novell-NOVLsas novell-NOVLntls novell-NOVLnmas novell-NOVLdif2dib novell-NOVLncp	The eDirectory replica server is installed on the specified server.
Administration Utilities	novell-NOVLice novell-NDSbase novell-NLDAPbase novell-NLDAPsdk novell-NOVLpkia novell-NOVLxis novell-NOVLimgnt	The Novell Import Conversion Export and LDAP Tools administration utilities are installed on the specified workstation.

- 2 If you are prompted, enter the complete path to the license file.

You will be prompted to enter the complete path to the license file only if the installation program cannot locate the file in the default location (/var, the mounted license diskette, or the current directory).

If the path you entered is not valid, you will be prompted to enter the correct path.

- 3 After the installation is complete, you need to update the following environment variables and export them. You can either do it manually or use a script.

- ♦ **Manually export the environment variables**

- ♦ For 32-bit

```
export LD_LIBRARY_PATH=/opt/novell/eDirectory/lib:/opt/novell/
eDirectory/lib/nds-modules:/opt/novell/lib:$LD_LIBRARY_PATH
```

- ♦ For 64-bit

```
export LD_LIBRARY_PATH=/opt/novell/eDirectory/lib64:/opt/novell/
eDirectory/lib64/nds-modules:/opt/novell/lib64:$LD_LIBRARY_PATH
```

```
export MANPATH=/opt/novell/man:/opt/novell/eDirectory/man:$MANPATH
```

```
export TEXTDOMAINDIR=/opt/novell/eDirectory/share/
locale:$TEXTDOMAINDIR
```

- ♦ **Use the ndspath script to export the environment variables**

If you do not want to export the paths manually, you can use the /opt/novell/eDirectory/bin/ndspath script as follows:

- ♦ Prefix the ndspath script to the utility and run the utility you want as follows:

```
/opt/novell/eDirectory/bin/ndspath utility_name_with_parameters
```

NOTE: When you prefix ndspath script to the commands with arguments, specify the arguments in double quotes.

For example:

```
/opt/novell/eDirectory/bin/ndspath ldapconfig "-s
ldapTLSRequired=yes"
```

- ♦ Export the paths in the current shell as follows:

```
. /opt/novell/eDirectory/bin/ndspath
```

After entering the above command, run the utilities as you would normally do.

- ♦ The path exporting instructions should be placed at the end of /etc/profile or ~/.bashrc or similar scripts. Therefore, whenever you log in or open a new shell, you can start using the utilities directly.

You can use the ndsconfig utility to configure eDirectory Server after installation.

Novell Modular Authentication Service (NMAS) is installed as part of the server component. By default, ndsconfig configures NMAS. You can also use the nmasinst utility to configure NMAS server after installation. This must be done after configuring eDirectory with ndsconfig.

For more information on the ndsconfig utility, see [“The ndsconfig Utility” on page 101](#).

For more information on the nmasinst utility, see [“Using the nmasinst Utility to Configure NMAS” on page 37](#).

1.6.3 Nonroot User Installing eDirectory 8.8

A nonroot user can install eDirectory 8.8 using the tarball.

Prerequisites

- ❑ Ensure that NCI is installed.

For information on installing NCI, refer to [“Installing NCI” on page 23](#).

- ❑ Ensure that SNMP subagent is installed using the command "rpm --nodeps <path of snmp subagent rpm>".
- ❑ If you want to use SLP and SNMP, ensure that they are installed by the root user.
- ❑ Write rights to the directory where you want to install eDirectory.

If you are a nonadministrator user, ensure that you have the appropriate rights as mentioned in the [Section 1.2, “Prerequisites,” on page 10](#) section.

Installing NCI

NCI should be installed before you proceed with the eDirectory installation. Both root and nonroot users can install NCI. With eDirectory 8.8 SP3 or later versions, 32 and 64-bit applications can coexist in a single system. This requires installing both 32 and 64-bit NCI. Use the --force option while installing the NCI packages. The command looks like as follows:

```
rpm -ivh --force nci_rpm_file_name_with_path
```

For 32-bit: The command is

```
rpm -ivh --force nci-2.7.4-0.01.i386_64.rpm
```

For 64-bit: The command is

```
rpm -ivh --force nci64-2.7.4-0.01.x86.rpm
```

Root User Installing NCI

To install NCI, complete the following procedure:

- 1 Enter the following command:

```
rpm -ivh nci_rpm_file_name_with_path
```

For example:

```
rpm -ivh nci-2.7.0-5.i386.rpm
```

- 2 To initialize NCI, enter the following:

```
ln -sf /var/opt/novell/nci /var/novell/nci
```

To ensure that NCI is set to server mode, enter the following:

```
/var/opt/novell/nci/set_server_mode
```

Nonroot User Installing NCI

Nonroot users can make use of the sudo utility to install NCI. Sudo (superuser do) allows a root user to give certain users the ability to run some commands as root. A root user can do this by editing the `/etc/sudoers` configuration file and adding appropriate entries in it.

For more information, refer to the [sudo Website \(http://www.sudo.ws/\)](http://www.sudo.ws/).

WARNING: sudo enables you to give limited root permissions to nonroot users. Therefore, you must understand the security implications before proceeding.

A root user needs to complete the following procedure to enable a nonroot user (for example, john) to install NCI:

- 1 Log in as root.
- 2 Edit the `/etc/sudoers` configuration file using the `visudo` command.

NOTE: There is no space between `vi` and `sudo` in the command.

Make an entry with the following information:

Username hostname=(root) NOPASSWD: /bin/rpm

For example, to enable john to run `/bin/rpm` as root on the hostname `lnx-2`, type the following:

john lnx-2=(root) NOPASSWD: /bin/rpm

A nonroot user (john in the example) needs to do the following to install NCI:

- 1 Log in as john and execute the following command:

```
sudo rpm -ivh nici_rpm_file_name_with_path
```

For example:

```
sudo rpm -ivh /88/Linux/Linux/setup/nici-2.7.0-5.i386.rpm
```

- 2 To initialize NCI, enter the following:

```
ln -sf /var/opt/novell/nici /var/novell/nici
```

To ensure that NCI is set to server mode, enter the following:

```
/var/opt/novell/nici/set_server_mode
```

NCI gets installed in the server mode.

Installing eDirectory

- 1 Go to the directory where you want to install eDirectory.
- 2 Untar the tar file as follows:

```
tar xvf /tar_file_name
```

The `etc`, `opt`, and `var` directories are created.

- 3 Export the paths as follows:

- ♦ **Manually export the environment variables**
 - ♦ For 32-bit


```
export LD_LIBRARY_PATH=custom_location/eDirectory/opt/novell/
eDirectory/lib:custom_location/eDirectory/opt/novell/eDirectory/
lib/nds-modules:custom_location/eDirectory/opt/novell/
lib:$LD_LIBRARY_PATH
```

```
export PATH=custom_location/eDirectory/opt/novell/eDirectory/
bin:custom_location/eDirectory/opt/novell/eDirectory/sbin:/opt/
novell/eDirectory/bin:$PATH
```

```
export MANPATH=custom_location/eDirectory/opt/novell/
man:custom_location/eDirectory/opt/novell/eDirectory/man:$MANPATH
```

```
export TEXTDOMAINDIR=custom_location/eDirectory/opt/novell/
eDirectory/share/locale:$TEXTDOMAINDIR
```

- ♦ For 64-bit

```
export LD_LIBRARY_PATH=custom_location/eDirectory/opt/novell/
eDirectory/lib64:custom_location/eDirectory/opt/novell/eDirectory/
lib64/nds-modules:custom_location/eDirectory/opt/novell/
lib64:$LD_LIBRARY_PATH
```

```
export PATH=custom_location/eDirectory/opt/novell/eDirectory/
bin:custom_location/eDirectory/opt/novell/eDirectory/sbin:/opt/
novell/eDirectory/bin:$PATH
```

```
export MANPATH=custom_location/eDirectory/opt/novell/
man:custom_location/eDirectory/opt/novell/eDirectory/man:$MANPATH
```

```
export TEXTDOMAINDIR=custom_location/eDirectory/opt/novell/
eDirectory/share/locale:$TEXTDOMAINDIR
```

- ♦ Use the `ndspath` script to export the environment variables

If you do not want to export the paths manually, prefix the `ndspath` script to the utility.

- ♦ Run the utility you want as follows:

```
custom_location/eDirectory/opt/novell/eDirectory/bin/ndspath
utility_name_with_parameters
```

- ♦ Export the paths in the current shell as follows :

```
. custom_location/eDirectory/opt/novell/eDirectory/bin/ndspath
```

NOTE: Ensure that you enter the above commands from the `custom_location/eDirectory/opt` directory.

After entering the above commands, run the utilities as you would normally do.

- ♦ Call the script in your profile, `bashrc`, or similar scripts. Therefore, whenever you log in or open a new shell, you can start using the utilities directly.

4 Configure eDirectory in the usual manner.

You can configure eDirectory in any of the following ways:

- ♦ Use the `ndsconfig` utility as follows:

```
ndsconfig new [-t <treename>] [-n <server_context>] [-a <admin_FDN>]
[-w <admin_password>] [-i] [-S <server_name>] [-d <path_for_dib>] [-m
<module>] [-e] [-L <ldap_port>] [-l <SSL_port>] [-o <http_port>] -O
<https_port>] [-p <IP address:[port]>] [-c] [-b <port_to_bind>] [-B
<interface1@port1>, <interface2@port2>,...] [-D <custom_location>] [--
config-file <configuration_file>]
```

For example:

```
ndsconfig new -t mary-tree -n novell -a admin.novell -S linux1 -d /
home/mary/inst1/data -b 1025 -L 1026 -l 1027 -o 1028 -O 1029 -D /home/
mary/inst1/var --config-file /home/mary/inst1/nds.conf
```

The port numbers you enter need to be in the range 1024 to 65535. Port numbers lesser than 1024 are normally reserved for the super-user and standard applications. Therefore, you cannot assume the default port 524 for any eDirectory applications.

This might cause the following applications to break:

- ♦ The applications that don't have an option to specify the target server port.
- ♦ The older applications that use NCP, and run as root for 524.
- ♦ Use the ndsmanage utility to configure a new instance. For more information, refer to the [“Creating an Instance through ndsmanage” on page 33](#).

Follow the onscreen instructions to complete the configuration.

For more information, see [Section 1.6.4, “Using the ndsconfig Utility to Add or Remove the eDirectory Replica Server,” on page 26](#).

IMPORTANT: Security Services cannot be updated separately with the tarball installation of eDirectory unlike the package installs. For tarball installation, the security updates can be obtained only through eDirectory support packs.

1.6.4 Using the ndsconfig Utility to Add or Remove the eDirectory Replica Server

You must have Administrator rights to use the ndsconfig utility. When this utility is used with arguments, it validates all arguments and prompts for the password of the user having Administrator rights. If the utility is used without arguments, ndsconfig displays a description of the utility and available options. This utility can also be used to remove the eDirectory Replica Server and change the current configuration of eDirectory Server. For more information, see [“The ndsconfig Utility” on page 101](#).

Prerequisite for Configuring eDirectory in a Specific Locale

If you want to configure eDirectory in a specific locale, you need to export LC_ALL and LANG to that particular locale before eDirectory configuration. For example, to configure eDirectory in the Japanese locale, enter the following:

```
export LC_ALL=ja
export LANG=ja
```

Creating A New Tree

Use the following syntax:

```
ndsconfig new [-t <treename>] [-n <server context>] [-a <admin FDN>] [-i] [-S
<server name>] [-d <path for dib>] [-m <module>] [-e] [-L <ldap port>] [-l <SSL
port>] [-o <http port>] [-O <https port>] [-p <IP address:[port]>] [-R] [-c]
[-w <admin password>] [-b <port to bind>] [-B <interface1@port1>,
<interface2@port2>,...] [-D <custom_location>] [--config-file
<configuration_file>]
```

A new tree is installed with the specified tree name and context.

There is a limitation on the number of characters in the *tree_name*, *admin FDN* and *server FDN* variables. The maximum number of characters allowed for these variables is as follows:

- ♦ *tree_name*: 32 characters
- ♦ *admin FDN*: 256 characters
- ♦ *server FDN*: 256 characters

If the parameters are not specified in the command line, ndsconfig prompts you to enter values for each of the missing parameters.

Or, you can also use the following syntax:

```
ndsconfig def [-t <treename>] [-n <server context>] [-a <admin FDN>] [-w
<admin password>] [-c] [-i] [-S <server name>] [-d <path for dib>] [-m
<module>] [-e] [-L <ldap port>] [-l <SSL port>] [-o <http port>] [-O <https
port>] [-D <custom_location>] [--config-file <configuration_file>]
```

A new tree is installed with the specified tree name and context. If the parameters are not specified in the command line, ndsconfig takes the default value for each of the missing parameters.

For example, to create a new tree, you could enter the following command:

```
ndsconfig new -t corp-tree -n o=company -a cn=admin.o=company
```

Adding a Server into an Existing Tree

Use the following syntax:

```
ndsconfig add [-t <treename>] [-n <server context>] [-a <admin FDN>] [-w
<admin password>] [-e] [-P <LDAP URL(s)>] [-L <ldap port>] [-l <SSL port>] [-o
<http port>] [-O <https port>] [-S <server name>] [-d <path for dib>] [-m
<module>] [-p <IP address:[port]>] [-R] [-c] [-b <port to bind>] [-B
<interface1@port1>, <interface2@port2>,...] [-D <custom_location>] [--config-
file <configuration_file>] [-E]
```

A server is added to an existing tree in the specified context. If the context that the user wants to add the Server object to does not exist, ndsconfig creates the context and adds the server.

LDAP and security services can also be added after eDirectory has been installed into the existing tree.

For example, to add a server into an existing tree, you could enter the following command:

```
ndsconfig add -t corp-tree -n o=company -a cn=admin.o=company -S srv1
```

You can enable encrypted replication in the server you want to add using the -E option. For more information on encrypted replication, refer to *Novell eDirectory 8.8 Administration Guide* (<http://www.novell.com/documentation/edir88/index.html>).

Removing a Server Object And Directory Services From a Tree

Use the following syntax:

```
ndsconfig rm [-a <admin FDN>] [-w <admin password>] [-p <IP address:[port]>]  
[-c]
```

eDirectory and its database are removed from the server.

NOTE: The HTML files created using iMonitor will not be removed. You must manually remove these files from `/var/opt/novell/eDirectory/data/dsreports` before removing eDirectory.

For example, to remove the eDirectory Server object and directory services from a tree, you could enter the following command:

```
ndsconfig rm -a cn=admin.o=company
```

ndsconfig Utility Parameters

ndsconfig Parameter	Description
new	Creates a new eDirectory tree. If the parameters are not specified in the command line, ndsconfig prompts you to enter values for each of the missing parameters.
def	Creates a new eDirectory tree. If the parameters are not specified in the command line, ndsconfig takes the default value for each of the missing parameters.
add	Adds a server into an existing tree. Also adds LDAP and SAS services, after eDirectory has been configured in the existing tree.
rm	Removes the Server object and directory services from a tree. NOTE: This option does not remove the key material objects. These objects must be removed manually.
upgrade	Upgrades eDirectory to a later version.
-i	While configuring a new tree, ignores checking whether a tree of the same name exists. Multiple trees of the same name can exist.

ndsconfig Parameter	Description
-S server name	<p>Specifies the server name. The server name can also contain dots (for example, novell.com). Because ndsconfig is a command line utility, using containers with dotted names requires that those dots be escaped out, and the parameters containing these contexts must be enclosed in double quotes.</p> <p>For example, to install a new eDirectory tree on a UNIX server using "novell.com" as the name of the O, use the following command:</p> <pre>ndsconfig new -a "admin.novell\\.com" -t novell_tree -n "OU=servers.O=novell\\.com"</pre> <p>The Admin name and context and the server context parameters are enclosed in double quotes, and only the '.' in novell.com is escaped using the '\\' (backslash) character. You can also use this format when installing a server into an existing tree.</p> <hr/> <p>NOTE: You cannot start a name with a dot. For example, you cannot install a server that has the name ".novell", because it starts with a dot ('.').</p> <hr/>
-t treename	<p>The tree name to which the server has to be added. It can have a maximum of 32 characters. If not specified, ndsconfig takes the tree name from the n4u.nds.tree-name parameter that is specified in the /etc/opt/novell/eDirectory/conf/nds.conf file. The default treename is \$LOGNAME-\$HOSTNAME-NDStree.</p>
-n server context	<p>Specifies the context of the server in which the server object is added. It can have a maximum of 64 characters. If the context is not specified, ndsconfig takes the context from the configuration parameter n4u.nds.server-context specified in the /etc/opt/novell/eDirectory/conf/nds.conf file. The server context should be specified in the typed form. The default context is org.</p>
-d path for dib	<p>The directory path where the database files will be stored.</p>
-r	<p>This option forcefully adds the replica of the server regardless of the number of servers already added to the server.</p>
-L ldap_port	<p>Specifies the TCP port number on the LDAP server. If the default port 389 is already in use, it prompts for a new port.</p>
-l ssl_port	<p>Specifies the SSL port number on the LDAP server. If the default port 636 is already in use, it prompts for a new port.</p>
-a admin FDN	<p>Specifies the fully distinguished name of the User object with Supervisor rights to the context in which the server object and Directory services are to be created. The admin name should be specified in the typed form. It can have a maximum of 64 characters. The default admin name is admin.org.</p>
-e	<p>Enables clear text passwords for LDAP objects.</p>
-m modulename	<p>Specifies the module name to configure. While configuring a new tree, you can configure only the ds module. After configuring the ds module, you can add the NMAS, LDAP, SAS, SNMP, HTTP services, and Novell SecretStore (ss) using the add command. If the module name is not specified, all the modules are installed.</p> <hr/> <p>NOTE: If you do not want to configure Novell SecretStore during eDirectory upgrade through nds-install, pass the 'no_ss' value to this option; that is nds-install '-m no_ss'.</p> <hr/>

ndsconfig Parameter	Description
-o	Specifies the HTTP clear port number.
-O	Specifies the HTTP secure port number.
-p <IP address:[port >	This option is used for secondary server addition ('add' command) to a tree. It specifies the IP address of the remote host that holds a replica of the partition to which this server is being added. The default port number is 524. This helps in faster lookup of the tree since it avoids SLP lookup.
-R	By default a replica of the partition to which the server is added would be replicated to the local server. This option disallows adding replicas to the local server.
-c	This option avoids prompts during ndsconfig operation, such as yes/no to continue the operation, or prompt to re-enter port numbers when there is a conflict, etc. The user receives prompts only for entering mandatory parameters if they are not passed on command line.
-w <admin password>	This option allows passing the admin user password in clear text. NOTE: Since password is passed in clear text, this is not recommended as a safe option owing to password insecurity.
-E	Enables encrypted replication for the server you are trying to add.
-j	Jumps or overrides the health check option before installing eDirectory.
-b port to bind	Sets the default port number on which a particular instance should listen on. This sets the default port number on n4u.server.tcp-port and n4u.server.udp-port. If an NCP port is passed using the -b option, then it is assumed to be the default port and the TCP and UDP params are updated accordingly. NOTE: -b and -B are exclusively used.
-B interface1@p ort1, interface2@p ort2,...	Specifies the port number along with the IP address or interface. For example: -B eth0@524 or -B 100.1.1.2@524 NOTE: -b and -B are mutually exclusive.
--config-file configuration file	Specify the absolute path and file name to store the nds.conf configuration file. For example, to store the configuration file in the /etc/opt/novell/eDirectory/directory, enter --config-file /etc/opt/novell/eDirectory/nds.conf.
-P <LDAP URL(s)>	Allows the LDAP URLs to configure the LDAP interface on the LDAP Server object. For example: -P ldap://1.2.3.4:1389,ldaps://1.2.3.4:1636
-D path_for_dat a	Creates the data, dib, and log directories in the path mentioned.

ndsconfig Parameter	Description
set valuelist	<p>Sets the value for the specified eDirectory configurable parameters. It is used to set the bootstrapping parameters before configuring a tree. When configuration parameters are changed, ndsd needs to be restarted for the new value to take effect. However, for some configuration parameters, ndsd need not be restarted.</p> <p>These parameters are listed below:</p> <ul style="list-style-type: none"> ♦ n4u.nds.inactivity-synchronization-interval ♦ n4u.nds.synchronization-restrictions ♦ n4u.nds.janitor-interval ♦ n4u.nds.backlink-interval ♦ n4u.nds.drl-interval ♦ n4u.nds.flatcleaning-interval ♦ n4u.nds.server-state-up-threshold ♦ n4u.nds.heartbeat-schema ♦ n4u.nds.heartbeat-data
get help paramlist	<p>Use to view the help strings for the specified eDirectory configurable parameters. If the parameter list is not specified, ndsconfig lists the help strings for all the eDirectory configurable parameters.</p>
set valuelist	<p>Sets the value for the specified eDirectory configurable parameters. It is used to set the bootstrapping parameters before configuring a tree.</p> <p>When configuration parameters are changed, ndsd needs to be restarted for the new value to take effect.</p>
get paramlist	<p>Use to view the current value of the specified eDirectory configurable parameters. If the parameter list is not specified, ndsconfig lists all the eDirectory configurable parameters.</p>

1.6.5 Using ndsconfig to Configure Multiple Instances of eDirectory 8.8

You can configure multiple instances of eDirectory 8.8 on a single host. For conceptual information on multiple instances, see Multiple Instance Support in the *Novell eDirectory 8.8 What's New Guide* (<http://www.novell.com/documentation/edir88/edir88new/data/bqebx8t.html>).

The method to configure multiple instance is similar to configuring a single instance multiple times. Each instance should have unique instance identifiers, such as the following:

- ♦ Different data and log file location
You can use the ndsconfig **--config-file**, **-d**, and **-D** options to do this.
- ♦ Unique portnumber for the instance to listen to
You can use the ndsconfig **-b** and **-B** options to do this.
- ♦ Unique server name for the instance
You can use the ndsconfig **-S server name** option to do this.

IMPORTANT: During eDirectory configuration, the default NCP server name is set as the host server name. When configuring multiple instances, you must change NCP server name. Use the `ndsconfig` command line option, `-S <server_name>` to specify a different server name.

When configuring multiple instances, either on the same tree or on different trees, the NCP server name should be unique.

NOTE: All the instances share the same server key (NICI).

You can also create a new instance using the `ndsmanage` utility. For more information, see [“Creating an Instance through ndsmanage” on page 33](#).

To list all the instances on a specific host and do other operations on them, you can use the `ndsmanage` utility.

IMPORTANT: The `install_location/etc/opt/novell/eDirectory/conf` directory contains some of the critical configuration information used for tracking and managing the eDirectory instances running on your server. Do not remove any contents from this directory.

This sections explains the following:

- ♦ [“The ndsmanage Utility” on page 32](#)
- ♦ [“Listing the Instances” on page 32](#)
- ♦ [“Creating an Instance through ndsmanage” on page 33](#)
- ♦ [“Performing Operations for a Specific Instance” on page 34](#)

The ndsmanage Utility

The `ndsmanage` utility enables you to do the following:

- ♦ [List the instances configured](#)
- ♦ [Create a new instance](#)
- ♦ [Do the following for a selected instance:](#)
 - ♦ List the replicas on the server
 - ♦ Start the instance
 - ♦ Stop the instance
 - ♦ Run `ndstrace` for the instance
 - ♦ Deconfigure the instance
- ♦ [Start and Stop all instances](#)

Listing the Instances

The following table describes how to list the eDirectory instances.

Table 1-1 *ndsmanage Usage for Listing the Instances*

Syntax	Description
ndsmanage	Lists all the instances configured by you.
ndsmanage -a --all	List instances of all the users who are using a particular installation of eDirectory.
ndsmanage <i>username</i>	List the instances configured by a specific user

The following fields are displayed for every instance:

- ♦ Configuration file path
- ♦ Server FDN and port
- ♦ Status (whether the instance is active or inactive)

NOTE: This utility lists all the instances configured for a single binary.

Refer to [Figure 1-1 on page 33](#) for more information.

Creating an Instance through ndsmanage

To create a new instance through ndsmanage:

- 1 Enter the following command:

```
ndsmanage
```

If you have two instances configured, the following screen is displayed:

Figure 1-1 *ndsmanage Utility Output Screen*

```
osg-dt-srv27(/space/kprajesh)>
osg-dt-srv27(/space/kprajesh)>ndsmanage
Server instances management utility for Novell eDirectory 8.8 SP 2 v20215.27

The following are the instances configured by root

[1] /etc/opt/novell/eDirectory/conf/nds.conf : .OSG-DT-SRV27.NOVELL.SOLAIX_SNMP_BUG. : 100.1.2.6@524 : ACTIVE
[2] /space/kprajesh/lsrv/etc/nds.conf : .OSG-DT-SRV27.NOVELL.KPR-SOL2. : eri0@1524 : ACTIVE

Enter [r] to refresh list, [1 - 2] for more options, [c] for creating a new instance or [q] to quit: █
```

- 2 Enter c to create a new instance.

You can either create a new tree or add a server to an existing tree. Follow the instructions on the screen to create a new instance.

Performing Operations for a Specific Instance

You can perform the following operations for every instance:

- ♦ “Starting a Specific Instance” on page 34
- ♦ “Stopping a Specific Instance” on page 34
- ♦ “Deconfiguring an Instance” on page 35

Other than the ones listed above, you can also run `ndstrace` for a selected instance.

Starting a Specific Instance

To start an instance configured by you, do the following:

- 1 Enter the following:

```
ndsmanage
```

- 2 Select the instance you want to start.

The menu expands to include the options you can perform on a specific instance.

Figure 1-2 *ndsmanage Utility Output Screen with Instance Options*

```
osg-dt-srv27(/space/kprajesh)>ndsmanage root
Server instances management utility for Novell eDirectory 8.8 SP 2 v20215.27

The following are the instances configured by root

[1] /etc/opt/novell/eDirectory/conf/nds.conf : .OSG-DT-SRV27.NOVELL.SOLAIX_SNMP_BUG. : 100.1.2.6@524 : ACTIVE
[2] /space/kprajesh/lsrv/etc/nds.conf : .OSG-DT-SRV27.NOVELL.KPR-SOL2. : eri0@1524 : ACTIVE

Enter [r] to refresh list, [1 - 2] for more options, [c] for creating a new instance or [q] to quit: 1

SELECTED INSTANCE:
[1] /etc/opt/novell/eDirectory/conf/nds.conf : .OSG-DT-SRV27.NOVELL.SOLAIX_SNMP_BUG. : 100.1.2.6@524 : ACTIVE

[l] List the replicas on the server
[s] Start the instance
[k] Stop the instance
[t] Run ndstrace
[d] Deconfigure
[b] Back to previous menu
[q] Quit

What do you want to do with this instance? [ Choose from above]:
```

- 3 Enter `s` to start the instance.

Alternatively, you can also enter the following at the command prompt:

```
ndsmanage start --config-file
configuration_file_of_the_instance_configured_by_you
```

Stopping a Specific Instance

To stop an instance configured by you, do the following:

- 1 Enter the following:

```
ndsmanage
```

- 2 Select the instance you want to stop.

The menu expands to include the options you can perform on a specific instance. For more information, refer to [ndsmanage Utility Output Screen with Instance Options \(page 34\)](#).

- 3 Enter k to stop the instance.

Alternatively, you can also enter the following at the command prompt:

```
ndsmanage stop --config-file  
configuration_file_of_the_instance_configured_by_you
```

Deconfiguring an Instance

To deconfigure an instance, do the following:

- 1 Enter the following:

```
ndsmanage
```

- 2 Select the instance you want to deconfigure.

The menu expands to include the options you can perform on a specific instance. For more information, refer to [ndsmanage Utility Output Screen with Instance Options \(page 34\)](#).

- 3 Enter d to deconfigure the instance.

Starting and Stopping All Instances

You can start and stop all the instances configured by you.

Starting all the Instances

To start all the instances configured by you, enter the following at the command prompt:

```
ndsmanage startall
```

To start a specific instance, refer to [“Starting a Specific Instance” on page 34](#).

Stopping All Instances

To stop all the instances configured by you, enter the following at the command prompt:

```
ndsmanage stopall
```

To stop a specific instance, refer to [“Stopping a Specific Instance” on page 34](#).

Example

Mary wants to configure 2 trees on a single host machine.

Planning the Setup

Mary specifies the following instance identifiers.

♦ Instance 1:

Port number the instance should listen on	1524
Configuration file path	/home/maryinst1/nds.conf
VAR directory	/home/mary/inst1/var

- ♦ **Instance 2:**

Port number the instance should listen on	2524
Configuration file path	/home/mary/inst2/nds.conf
VAR directory	/home/mary/inst2/var

Configuring the Instances

To configure the instances based on the above mentioned instance identifiers, Mary must enter the following commands.

- ♦ **Instance 1:**

```
ndsconfig new -t mytree -n o=novell -a cn=admin.o=company -b 1524 -D  
/home/mary/inst1/var --config-file /home/mary/inst1/nds.conf
```

- ♦ **Instance 2:**

```
ndsconfig new -t corptree -n o=novell -a cn=admin.o=company -b 2524 -D  
/home/mary/inst2/var --config-file /home/mary/inst2/nds.conf
```

NOTE: On UNIX/Linux, OS restricts sockets creation on the mounted file system. The same restriction is applicable to NSS volumes. With eDirectory, it is recommended to have the var directory on the local file system (-D option with ndsconfig) and the DIB directory can be of any file system (-d option with ndsconfig).

Invoking a Utility for an Instance

If Mary wants to run the ndstrace utility for instance 1 that is listening on port 1524, with its configuration file in /home/mary/inst1/nds.conf location and its DIB file located in /home/mary/inst1/var, then she can run the utility as follows:

```
ndstrace --config-file /home/mary/inst1/nds.conf
```

or

```
ndstrace -h 164.99.146.109:1524
```

If Mary does not specify the instance identifiers, the utility displays all the instances owned by Mary and prompts her to select an instance.

Listing the Instances

If Mary wants to know details about the instances in the host, she can run the ndsmanage utility.

- ♦ To display all instances owned by Mary:

```
ndsmanage
```

- ♦ To display all instances owned by John (username is john):

```
ndsmanage john
```

- ♦ To display all instances of all users that are using a particular installation of eDirectory:

```
ndsmanage -a
```

1.6.6 Using ndsconfig to Install a Linux Server into a Tree with Dotted Name Containers

You can use ndsconfig to install a Linux server into an eDirectory tree that has containers using dotted names (for example, novell.com).

Because ndsconfig is a command line utility, using containers with dotted names requires that those dots be escaped out, and the parameters containing these contexts must be enclosed in double quotes. For example, to install a new eDirectory tree on a Linux server using “O=novell.com” as the name of the O, use the following command:

```
ndsconfig new -a 'admin.novell.com' -t novell_tree -n 'OU=servers.O=novell.com'
```

The Admin name and context and the server context parameters are enclosed in double quotes, and only the dot (‘.’) in novell.com is escaped using the ‘\’ (backslash) character.

You can also use this format when installing a server into an existing tree.

NOTE: You should use this format when entering dotted admin name and context while using utilities such as ndsrepair, ndsbackup, ndsmmerge, ndslogin, and ldapconfig.

1.6.7 Using the nmasinst Utility to Configure NMAS

From eDirectory 8.7.3 onwards, by default, ndsconfig configures NMAS. You can also use nmasinst on Linux, Solaris, and AIX systems to configure NMAS.

ndsconfig only configures NMAS and does not install the login methods. To install these login methods, you can use nmasinst.

IMPORTANT: You must configure eDirectory with ndsconfig before you install the NMAS login methods. You must also have administrative rights to the tree.

- ♦ [“Configuring NMAS” on page 37](#)
- ♦ [“Installing Login Methods” on page 38](#)

Configuring NMAS

By default, ndsconfig configures NMAS. You can also use nmasinst for the same.

To configure NMAS and create NMAS objects in eDirectory, enter the following at the server console command line:

```
nmasinst -i admin.context tree_name
```

nmasinst will prompt you for a password.

This command creates the objects in the Security container that NMAS needs, and installs the LDAP extensions for NMAS on the LDAP Server object in eDirectory.

The first time NMAS is installed in a tree, it must be installed by a user with enough rights to create objects in the Security container. However, subsequent installs can be done by container administrators with read-only rights to the Security container. nmasinst will verify that the NMAS objects exist in the Security container before it tries to create them.

nmasinst does not extend the schema. The NMAS schema is installed as part of the base eDirectory schema.

Installing Login Methods

To install login methods using nmasinst, enter the following at the server console command line:

```
nmasinst -addmethod admin.context tree_name config.txt_path
```

The last parameter specifies the config.txt file for the login method that is to be installed. A config.txt file is provided with each login method.

Here is an example of the -addmethod command:

```
nmasinst -addmethod admin.novell MY_TREE ./nmas-methods/novell/Simple  
Password/config.txt
```

If the login method already exists, nmasinst will update it.

For more information, see “Managing Login and Post-Login Methods and Sequences” (<http://www.novell.com/documentation/nmas30/admin/data/a53vj9a.html>) in the *Novell Modular Authentication Service Administration Guide*.

1.6.8 Nonroot user SNMP configuration

NICI and NOVLSubag should be installed as root user.

1 Root User Installing NICI. Refer to “Root User Installing NICI” on page 23

2 Root User Installing NOVLSubag.

To install NOVLSubag, complete the following procedure:

Enter the following command:

```
rpm -ivh --nodeps NOVLSubag_rpm_file_name_with_path
```

For example:

```
rpm -ivh --nodeps novell-NOVLSubag-8.8.1-5.i386.rpm
```

3 Export the paths as follows:

Manually export the environment variables.

- ♦ For 32-bit

```
export LD_LIBRARY_PATH=custom_location/opt/novell/  
eDirectory/lib:custom_location/opt/novell/lib:/opt/novell/lib:/  
opt/novell/eDirectory/lib:$LD_LIBRARY_PATH
```

- ♦ For 64-bit

```
export LD_LIBRARY_PATH=custom_location/opt/novell/eDirectory/lib64:/  
opt/novell/eDirectory/lib64/nds-modules:/opt/novell/  
lib64:$LD_LIBRARY_PATH
```

```
export PATH=/opt/novell/eDirectory/bin:$PATH
```

```
export MANPATH=/opt/novell/man:$MANPATH
```

Installing or Upgrading Novell eDirectory on Solaris

2

Use the following information to install or upgrade Novell eDirectory 8.8 on a Solaris server:

- ♦ [Section 2.1, “System Requirements,” on page 39](#)
- ♦ [Section 2.2, “Prerequisites,” on page 40](#)
- ♦ [Section 2.3, “Hardware Requirements,” on page 41](#)
- ♦ [Section 2.4, “Forcing the Backlink Process to Run,” on page 42](#)
- ♦ [Section 2.5, “Upgrading eDirectory,” on page 42](#)
- ♦ [Section 2.6, “Installing eDirectory,” on page 43](#)

2.1 System Requirements

- ☐ One of the following:

For 32-bit eDirectory installation:

- ♦ Solaris 10 on Sun SPARC

For 64-bit eDirectory installation:

- ♦ Solaris 10 on Sun SPARC
- ♦ Solaris 10 Zones (Small Zone and Big Zone)

NOTE: Installation on Solaris 10 Zones is supported on eDirectory 8.8 SP5 or later. Regardless of the type of a zone, either a 32-bit eDirectory or a 64-bit eDirectory can be installed in each of the zones present in a system. In a zone only one type of eDirectory should be installed.

- ☐ Update your system with the following libumem patches:
 - ♦ Sun OS 5.10: libumem library patch for Solaris 10 on SPARC
 - ♦ Patch Id 121921-02

NOTE: All latest recommended set of patches are available on the [SunSolve* Web page \(http://sunsolve.sun.com\)](http://sunsolve.sun.com). If you do not update your system with the latest patches before installing eDirectory, you will get the patchadd error.

- ☐ A minimum of 512 MB RAM
- ☐ 184 MB of disk space for the eDirectory server
- ☐ 43 MB of disk space for the eDirectory administration utilities
- ☐ 150 MB of disk space for every 50,000 users

2.2 Prerequisites

IMPORTANT: Check the currently installed Novell and Third Party applications to determine if eDirectory 8.8 is supported before upgrading your existing eDirectory environment. You can find out the current status for Novell products in the [TID - What Novell products are supported with Novell eDirectory 8.8?](http://www.novell.com/support/php/search.do?cmd=displayKC&docType=kc&externalId=7003446&sliceId=1&docTypeID=DT_TID_1_1&dialogID=65754231&stateId=0%200%2065752376) (http://www.novell.com/support/php/search.do?cmd=displayKC&docType=kc&externalId=7003446&sliceId=1&docTypeID=DT_TID_1_1&dialogID=65754231&stateId=0%200%2065752376). You are highly recommended to back up eDirectory before any upgrades.

- ❑ (Conditional) NCI 2.7 and eDirectory 8.8 support key sizes up to 4096 bits. If you want to use a 4 KB key size, every server must be upgraded to eDirectory 8.8. In addition, every workstation using the management utilities, for example, iManager and ConsoleOne, must have NCI 2.7 installed on it.

When you upgrade your Certificate Authority (CA) server to eDirectory 8.8, the key size will not change; it will be 2 KB. The only way to create a 4 KB key size is recreate the CA on an eDirectory 8.8 server. In addition, you would have to change the default from 2 KB to 4 KB for the key size, during the CA creation.

The package containing NCI 2.7 is named `NOVLnu0-2.7` on Solaris.

For more information, refer to “Installing NCI” on page 23.

- ❑ SLP should be installed and configured.

With eDirectory 8.8, SLP does not get installed as part of the eDirectory installation.

If you are a root user, you need to install and configure SLP before proceeding with the eDirectory installation.

If you are a nonroot user, SLP should be installed and configured before you proceed with the eDirectory installation. A nonroot user cannot install SLP.

For more information on installing SLP, refer to “Using SLP with eDirectory” on page 44.

- ❑ Enable the Solaris host for multicast routing.

To check if the host is enabled for multicast routing, enter the following command:

```
/bin/netstat -nr
```

The following entry should be present in the routing table:

```
224.0.0.0 host_IP_address
```

If the entry is not present, log in as root, and enter the following command to enable multicast routing:

```
route add -net 224.0.0.0 -net 224.0.0.0 netmask 240.0.0.0 hme0
```

For more information on multicast and broadcast routes, refer to the [OpenSLP User Guide](http://www.openslp.org/doc/html/UsersGuide/Installation.html) (<http://www.openslp.org/doc/html/UsersGuide/Installation.html>).

- ❑ If you have more than one server in the tree, the time on all the network servers should be synchronized.

Use Network Time Protocol's (NTP) `xntpd` to synchronize time.

- ❑ To avail all the functionality of eMBox such as `dsmerge`, you need to install the latest Solaris patch - 12 March 2009 or later.

- ❑ (Conditional) If you are installing a secondary server, all the replicas in the partition that you install the product on should be in the On state.
- ❑ (Conditional) If you are installing a secondary server into an existing tree as a nonadministrator user, ensure that you have the following rights:
 - ♦ Supervisor rights to the container the server is being installed into.
 - ♦ Supervisor rights to the partition where you want to add the server.

NOTE: This is required for adding the replica when the replica count is less than 3.

- ♦ All Attributes rights: read, compare, and write rights over the W0.KAP.Security object.
- ♦ Entry rights: browse rights over Security container object.
- ♦ All Attributes rights: read and compare rights over Security container object.
- ❑ (Conditional) If you are installing a secondary server into an existing tree as a nonadministrator user, ensure that at least one of the servers in the tree has the same or higher eDirectory version as that of the secondary being added as container admin. In case the secondary being added is of later version, then the schema needs to be extended by the admin of the tree before adding the secondary using container admin.
- ❑ While configuring eDirectory, you must enable SLP services and an NCPTM port (the default is 524) in the firewall to allow the secondary server addition. Additionally, you can enable the following service ports based on your requirements:
 - ♦ LDAP clear text - 389
 - ♦ LDAP secured - 636
 - ♦ HTTP clear text - 8028
 - ♦ HTTP secured - 8030

In case, if you have enabled user-defined ports, you must mention these ports while configuring eDirectory.

- ❑ During eDirectory upgrade, if SecretStore has not already been configured with the previous versions, or you do not want to configure SecretStore, use the `-m no_ss` option with the `nds-install` utility.

Configuring Static IP Address

Static IP address must be configured on the server for the eDirectory to perform efficiently. Configuring eDirectory on the servers with DHCP address can lead to unpredictable results.

2.3 Hardware Requirements

Hardware requirements depend on the specific implementation of eDirectory. Two factors increase performance: more cache memory and faster processors. For best results, cache as much of the DIB Set as the hardware allows.

eDirectory scales well on a single processor. However, Novell eDirectory 8.8 takes advantage of multiple processors. Adding processors improves performance in some areas—for example, logins and having multiple threads active on multiple processors. eDirectory itself is not processor intensive, but it is I/O intensive.

The following table illustrates typical system requirements for Novell eDirectory for Solaris.

Objects	Processor	Memory	Hard Disk
100,000	Sun* Enterprise 220	384 MB	144 MB
1 million	Sun Enterprise 450	2 GB	1.5 GB
10 million	Sun Enterprise 4500 with multiple processors	2+ GB	15 GB

Requirements for processors might be greater than the table indicates, depending upon additional services available on the computer as well as the number of authentications, reads, and writes that the computer is handling. Processes such as encryption and indexing can be processor intensive.

2.4 Forcing the Backlink Process to Run

Because the internal eDirectory identifiers change when upgrading to Novell eDirectory, the backlink process must update backlinked objects for them to be consistent.

Backlinks keep track of external references to objects on other servers. For each external reference on a server, the backlink process ensures that the real object exists in the correct location and verifies all backlink attributes on the master of the replica. The backlink process occurs two hours after the database is open, and then every 780 minutes (13 hours). The interval is configurable from 2 minutes to 10,080 minutes (7 days).

After migrating to eDirectory, start the ndstrace process by issuing the `ndstrace -l>log&` command, which runs the process at the background. You can force the backlink to run by issuing the `ndstrace -c set ndstrace=*B` command from the ndstrace command prompt. Then you can unload the ndstrace process by issuing the `ndstrace -u` command. Running the backlink process is especially important on servers that do not contain a replica.

2.5 Upgrading eDirectory

If you have eDirectory 8.5.x or 8.6.x, you have to first upgrade to eDirectory 8.7x and then upgrade to eDirectory 8.8.

```
./nds-install
```

NOTE: Upgrade LUM to 2.1.2 if an older version is installed on the system.

After the upgrade to eDirectory 8.8, the default location of the configuration files, data files, and log files are changed to `/etc/opt/novell/eDirectory/conf`, `/var/opt/novell/eDirectory/data`, and `/var/opt/novell/eDirectory/log` respectively.

The new directory `/var/opt/novell/eDirectory/data` uses a symbolic link to the `/var/nds` directory.

The old configuration file `/etc/nds.conf` is migrated to `/etc/opt/novell/eDirectory/conf` directory. The old configuration file `/etc/nds.conf` is renamed to `/etc/nds.conf_pre88` and the old log files under `/var/nds` are retained for reference.

NOTE: “ndsconfig upgrade” has to be run after `nds-install`, if upgrade of the DIB fails and `nds-install` asks to do so.

NOTE: Health check fails due to time sync. To resolve this issue, perform a time sync between the instances. You can ignore this warning message during upgrade.

2.5.1 Upgrading Multiple Instances

For information on Upgrading Multiple Instances, refer to [Section 1.5.7, “Upgrading Multiple Instances,” on page 18](#) in the Linux chapter.

2.5.2 Upgrading the Tarball Deployment of eDirectory 8.8

For information on Upgrading the Tarball Deployment of eDirectory 8.8, refer to [Section 1.5.6, “Upgrading the Tarball Deployment of eDirectory 8.8,” on page 16](#) in the Linux chapter.

2.6 Installing eDirectory

The following sections provide information about installing Novell eDirectory on Solaris:

- ♦ [Section 2.6.1, “Server Health Checks,” on page 43](#)
- ♦ [Section 2.6.2, “Using SLP with eDirectory,” on page 44](#)
- ♦ [Section 2.6.3, “Using the Nds-install Utility to Install eDirectory Components,” on page 45](#)
- ♦ [Section 2.6.4, “Nonroot User Installing eDirectory 8.8,” on page 47](#)
- ♦ [Section 2.6.5, “Installing eDirectory 8.8 on Solaris 10 Zones,” on page 50](#)
- ♦ [Section 2.6.6, “Using the Ndsconfig Utility to Add or Remove the eDirectory Replica Server,” on page 51](#)
- ♦ [Section 2.6.7, “Using ndsconfig to Configure Multiple Instances of eDirectory 8.8,” on page 53](#)
- ♦ [Section 2.6.8, “Using Ndsconfig to Install a Solaris Server into a Tree with Dotted Name Containers,” on page 53](#)
- ♦ [Section 2.6.9, “Using the Nmasinst Utility to Configure NMAS,” on page 53](#)
- ♦ [Section 2.6.10, “Nonroot user SNMP configuration,” on page 54](#)

2.6.1 Server Health Checks

With eDirectory 8.8, when you upgrade or install eDirectory, two server health checks are conducted by default to ensure that the server is safe for the upgrade.

- ♦ [Section B.3.1, “Basic Server Health,” on page 138](#)
- ♦ [Section B.3.2, “Partitions and Replica Health,” on page 139](#)

Based on the results obtained from the health checks, the upgrade will either continue or exit as follows:

- ♦ If all the health checks are successful, the upgrade will continue.
- ♦ If there are minor errors, the upgrade will prompt you to continue or exit.
- ♦ If there are critical errors, the upgrade will exit.

See [Appendix B, “eDirectory Health Checks,” on page 137](#) for a list of minor and critical error conditions.

Skipping Server Health Checks

To skip server health checks, use `nds-install -j` or `ndsconfig upgrade -j`.

For more information, see [Appendix B, “eDirectory Health Checks,”](#) on page 137.

2.6.2 Using SLP with eDirectory

In earlier releases of eDirectory, SLP was installed during the eDirectory install. But with eDirectory 8.8, you need to separately install SLP before proceeding with the eDirectory install.

If you plan to use SLP to resolve tree names, it should have been properly configured and SLP DAs should be stable.

- 1 To install SLP, enter the following:

```
pkgadd -d filename_and_absolute_path_of_NDSslp.pkg
```

The SLP package is present in the setup directory in the build. For example, if you have the build in the `/home/build` directory, enter the following command:

```
pkgadd -d /home/build/Solaris/Solaris/setup/NDSslp.pkg
```

- 2 Follow the onscreen instructions to complete SLP installation.
- 3 Start SLP.

If you don't want to (or cannot) use SLP, you can use the flat file `hosts.nds` to resolve tree names to server referrals. The `hosts.nds` file can be used to avoid SLP multicast delays when a SLP DA is not present in the network. `hosts.nds` is a static lookup table used by eDirectory applications to search eDirectory partition and servers. For more information on `hosts.nds`, refer to [“Using SLP with eDirectory”](#) on page 19 and the `hosts.nds` manpage.

If you decide to use SLP to resolve the tree name to determine if the eDirectory tree is advertised, after eDirectory and SLP are installed, enter the following:

```
/usr/bin/slpinfo -s "ndap.novell///(svcname-ws==[treename or *])"
```

For example, to search for the services whose `svcname-ws` attribute match with the value `SAMPLE_TREE`, enter the following command:

```
/usr/bin/slpinfo -s "ndap.novell///(svcname-ws==SAMPLE_TREE)/"
```

If you have a service registered with its `svcname-ws` attribute as `SAMPLE_TREE`, then the output will be similar to the following:

```
service:ndap.novell:///SAMPLE_TREE
```

If you do not have a service registered with its `svcname-ws` attribute as `SAMPLE_TREE`, there will be no output.

For more information, see [Appendix C, “Configuring OpenSLP for eDirectory,”](#) on page 143.

2.6.3 Using the Nds-install Utility to Install eDirectory Components

Use the nds-install utility to install eDirectory components on Solaris systems. This utility is located in the Setup directory on the CD for the Solaris platform. The utility adds the required packages based on what components you choose to install.

A nonroot user can install using only tarballs. For more information, refer to [Section 2.6.4, “Nonroot User Installing eDirectory 8.8,” on page 47.](#)

- 1 Enter the following command from the setup directory:

```
./nds-install
```

To install eDirectory components, use the following syntax:

```
nds-install [-h] [-i] [-j] [-u]
```

If you do not provide the required parameters in the command line, the nds-install utility will prompt you for the parameters.

The following table provides a description of the nds-install utility parameters:

nds-install Parameter	Description
-h	Displays help for nds-install.
-i	Prevents the nds-install script from invoking ndsconfig upgrade if a DIB is detected at the time of the upgrade.
-j	Jumps or overrides the health check option before installing eDirectory. For more information about health checks, refer to Appendix B, “eDirectory Health Checks,” on page 137.
-m	Specifies the module name to configure. While configuring a new tree, you can configure only the ds module. After configuring the ds module, you can add the NMAS, LDAP, SAS, SNMP, HTTP services, and Novell SecretStore (ss) using the add command. If the module name is not specified, all the modules are installed.
-u	Specifies the option to use an unattended install mode.

The installation program proceeds to add the appropriate RPMs or packages into the Solaris system. The following table lists the packages installed for each eDirectory component.

eDirectory Component	Packages Installed	Description
eDirectory Server	NDSbase NDScommon NDSmasv NDSserv NDSimon NDSrepair NDSdexvnt NOVLsubag NOVLsnmp NOVLpkit NOVLpkis NOVLpkia NOVLembox NOVLimgnt NOVLxis NLDAPsdk NLDAPbase NOVlsas NOVLntls NOVLnmas NOVLdif2dib NOVLncp	The eDirectory replica server is installed on the specified server.
Administration Utilities	NOVLice NDSbase NLDAPbase NLDAPsdk NOVLpkia NOVLxis NOVLimgnt	The Novell Import Conversion Export and LDAP Tools administration utilities are installed on the specified workstation.

2 If you are prompted, enter the complete path to the license file.

You will be prompted to enter the complete path to the license file only if the installation program cannot locate the file in the default location (/var, the mounted license diskette, or the current directory).

If the path you entered is not valid, you will be prompted to enter the correct path.

You can use the ndsconfig utility to configure eDirectory Server after installation.

Novell Modular Authentication Service (NMAS) is installed as part of the server component. By default, ndsconfig configures NMAS. By default, ndsconfig configures NMAS. You can also use the nmasinst utility to configure NMAS server after installation. This must be done after configuring eDirectory with ndsconfig.

For more information on the ndsconfig utility, see [“The ndsconfig Utility” on page 101](#).

For more information on the nmasinst utility, see [“Using the Nmasinst Utility to Configure NMAS” on page 53](#).

3 After the installation is complete, you need to update the following environment variables and export them as follows:

♦ **Manually export the environment variables**

32-bit: export LD_LIBRARY_PATH=/opt/novell/eDirectory/lib:/opt/novell/eDirectory/lib/nds-modules:/opt/novell/lib:\$LD_LIBRARY_PATH

```

64-bit: export LD_LIBRARY_PATH=/opt/novell/eDirectory/lib/sparcv9:/opt/
novell/eDirectory/lib/sparcv9/nds-modules:/opt/novell/lib/
sparcv9:$LD_LIBRARY_PATH

export PATH=/opt/novell/eDirectory/bin:/opt/novell/eDirectory/
sbin:$PATH

export MANPATH=/opt/novell/man:/opt/novell/eDirectory/man:$MANPATH

export TEXTDOMAINDIR=/opt/novell/eDirectory/share/
locale:$TEXTDOMAINDIR

```

- ◆ **Use the ndspath script to export the environment variables**

If you do not want to export the paths manually, you can use the `/opt/novell/eDirectory/bin/ndspath` script as follows:

- ◆ Prefix the ndspath script to the utility and run the utility you want as follows:
`/opt/novell/eDirectory/bin/ndspath utility_name_with_parameters`
- ◆ Export the paths in the current shell as follows:
`. /opt/novell/eDirectory/bin/ndspath`
 After entering the above command, run the utilities as you would normally do.
- ◆ Call the script in your profile, `bashrc`, or similar scripts. Therefore, whenever you log in or open a new shell, you can start using the utilities directly.

2.6.4 Nonroot User Installing eDirectory 8.8

A nonroot user can install eDirectory 8.8 using the tarball.

Prerequisites

- ❑ Ensure that NCI is installed.

For information on installing NCI, refer to [“Installing NCI” on page 23](#).

- ❑ If you want to use SLP and SNMP, ensure that they are installed by the root user.
- ❑ Write rights to the directory where you want to install eDirectory.

If you are a nonadministrator user, ensure that you have the appropriate rights as mentioned in the [Section 2.2, “Prerequisites,” on page 40](#) section.

Installing NCI

NCI should be installed before you proceed with the eDirectory installation. Both root and nonroot users can install NCI, though the procedure to do so is different.

Root User Installing NCI

To install NCI, complete the following procedure:

- 1 Enter the following command:

32-bit: `pkgadd -d NCI_package_absolute_path_and_filename NOVLniu0`

For example:

```
pkgadd -d /home/build/Solaris/Solaris/setup/NOVLniu0.pkg NOVLniu0
```

64-bit: `pkgadd -d NICI_package_absolute_path_and_filename NOVLniu64`

For example:

```
pkgadd -d /home/build/Solaris/Solaris/setup/NOVLniu64.pkg NOVLniu64
```

2 Execute the following script:

```
/var/opt/novell/nici/set_server_mode
```

Nonroot User Installing NICI

Nonroot users can make use of the sudo utility to install NICI. Sudo (superuser do) allows a root user to give certain users the ability to run some commands as root. A root user can do this by editing the `/etc/sudoers` configuration file and adding appropriate entries in it.

For more information, refer to the [sudo Website \(http://www.sudo.ws/\)](http://www.sudo.ws/).

WARNING: sudo enables you to give limited root permissions to nonroot users. Therefore, you must understand the security implications before proceeding.

A root user needs to complete the following procedure to enable a nonroot user (for example, john) to install NICI:

- 1 Log in as root.
- 2 Edit the `/etc/sudoers` configuration file using the `visudo` command.

NOTE: There is no space between `vi` and `sudo` in the command.

3 Make an entry with the following information:

```
Username    hostname=(root) NOPASSWD: /usr/sbin/pkgadd
```

For example, to enable john to run `/usr/sbin/pkgadd` as root on the hostname `sol-2`, type the following:

```
john        sol-2=(root) NOPASSWD: /usr/sbin/pkgadd
```

A nonroot user (john in the example) needs to do the following to install NICI:

1 Log in as john and execute the following command:

```
sudo pkgadd -d absolute_path_of_the_NICI_package NOVLniu0
```

For example:

```
sudo pkgadd -d /home/build/Solaris/Solaris/setup/NOVLniu0.pkg NOVLniu0
```

2 Execute the following script:

```
sudo /var/opt/novell/nici/set_server_mode
```

NICI gets installed in the server mode.

Installing eDirectory

- 1 Go to the directory where you want to install eDirectory .
- 2 Untar the tar file as follows:

```
tar xvf /tar_file_name
```


3 Export the paths as follows:

- ♦ **Manually export the environment variables**

32-bit: export LD_LIBRARY_PATH=custom_location/eDirectory/opt/novell/
eDirectory/lib:custom_location/eDirectory/opt/novell/eDirectory/lib/nds-
modules:custom_location/eDirectory/opt/novell/lib:/opt/novell/lib:/opt/
novell/eDirectory/lib:\$LD_LIBRARY_PATH

64-bit: export LD_LIBRARY_PATH=custom_location/eDirectory/opt/novell/
eDirectory/lib/sparcv9:custom_location/eDirectory/opt/novell/eDirectory/lib/
sparcv9/nds-modules:custom_location/eDirectory/opt/novell/lib/sparcv9:/opt/
novell/lib/sparcv9:/opt/novell/eDirectory/lib/sparcv9:\$LD_LIBRARY_PATH

export PATH=custom_location/eDirectory/opt/novell/eDirectory/
bin:custom_location/eDirectory/opt/novell/eDirectory/sbin:/opt/
novell/eDirectory/bin:\$PATH

export MANPATH=custom_location/eDirectory/opt/novell/
man:custom_location/eDirectory/opt/novell/eDirectory/man:\$MANPATH

export TEXTDOMAINDIR=custom_location/eDirectory/opt/novell/eDirectory/
share/locale:\$TEXTDOMAINDIR

- ♦ **Use the ndspath script to export the environment variables**

Prefix the ndspath script to the utility if you do not want to export the paths manually.

- ♦ Run the utility you want as follows:

custom_location/eDirectory/opt/novell/eDirectory/bin/ndspath
utility_name_with_parameters

- ♦ Export the paths in the current shell as follows:

. custom_location/eDirectory/opt/novell/eDirectory/bin/ndspath

NOTE: Ensure that you enter the above commands from the *custom_location/
eDirectory/opt* directory.

After entering the above command, run the utilities as you would normally do.

- ♦ Call the script in your profile, bashrc, or similar scripts. Therefore, whenever you log in or open a new shell, you can start using the utilities directly.

4 Configure eDirectory in the usual manner.

You can configure eDirectory in any of the following ways:

- ♦ Use the ndsconfig utility as follows:

ndsconfig new -t *treename* -n *server_context* -a *admin_FDN* [-i] [-S
server_name] [-d *path_for_dib*] [-m *module*] [e] [-L *ldap_port*] [-l
SSL_port] [-o *http_port*] -O *https_port*] [-b *port_to_bind*] [-B
interface1@port1, interface2@port2,...] [-D *custom_location*] [--config-
file *configuration_file*]

For example:

ndsconfig new -t mary-tree -n novell -a admin.novell -S linux1 -d /
home/mary/inst1/data -b 1025 -L 1026 -l 1027 -o 1028 -O 1029 -D /home/
mary/inst1/var --config-file /home/mary/inst1/nds.conf

The port numbers you enter need to be in the range 1024 to 65535. Port numbers lesser than 1024 are normally reserved for the super-user and standard applications. Therefore, you cannot assume the default port 524 for any eDirectory applications.

This might cause the following applications to break:

- ♦ The applications that don't have an option to specify the target server port.
- ♦ The older applications that use NCP, and are run as root for 524.
- ♦ Use the ndsmanage utility to configure a new instance. For more information, refer to the [“Creating an Instance through ndsmanage” on page 33](#).

Follow the onscreen instructions to complete the configuration.

For more information, see [Section 2.6.6, “Using the Ndsconfig Utility to Add or Remove the eDirectory Replica Server,” on page 51](#).

2.6.5 Installing eDirectory 8.8 on Solaris 10 Zones

eDirectory 8.8 SP5 or later versions can be installed on Solaris* 10 Zones.

An Introduction to Zones

A zone is a virtual instance of Solaris. It is also one of the software partitions of the operating system. A large SunFire server with hardware domains allows the creation of several isolated systems. It is easy to move individual CPUs between the zones as needed, or to configure the sharing of CPUs and memory.

Types of Zones

There are two types of zones, a global zone and a non-global zone.

Global Zone

The global zone is the original Solaris OS instance, which has access to the physical hardware and can control all the processes. Global zones create non-global zones that are authorized to create and control new zones in which the applications run.

Non-Global Zone

A non-global zone is aligned with the global zones, but does not run inside them. Global zones can monitor the configuration of the non-global zones and control them. You can choose two general non-global zone types during the zone creation, a Small Zone and a Big Zone.

Small Zone (Sparse Root Zone)

A small zone is the default zone that consumes the least disk space. It is high performing and highly secure.

NOTE: Before installing eDirectory on a small zone, NCI should be installed on the global zone. For information on installing NCI, refer to [“Installing NCI” on page 23](#)

Big Zone (Whole Root Zone)

A big zone has its own `/usr` files, which can be modified independently.

For more information on Solaris* Zones refer to the following links:

Information on Zones (<http://www.solarisinternals.com/wiki/index.php/Zones#Zones>)

Information on the Solaris Operating System (<http://www.sun.com/software/solaris/howtoguides/containersLowRes.jsp>)

Installing eDirectory 8.8 on a Global or Non-Global Zone

Use the `nds-install` utility to install eDirectory components on a Solaris* 10 Zones system. This utility is present in the `setup` directory, in the CD provided for eDirectory installation on a Solaris platform. This utility adds the required packages, based on the components you choose to install.

To run the `nds-install` utility, enter the following command from the `setup` directory:

```
./nds-install
```

After installation, use the `ndsconfig` utility for configuring the eDirectory installed on the Solaris* 10 Zones system. For more information on the `ndsconfig` utility refer to the [Novell Documentation Website](http://www.novell.com/documentation/edir88/edirin88/data/a7f5t0z.html#a7f7ods) (<http://www.novell.com/documentation/edir88/edirin88/data/a7f5t0z.html#a7f7ods>)

2.6.6 Using the Ndsconfig Utility to Add or Remove the eDirectory Replica Server

You must have Administrator rights to use the `ndsconfig` utility. When this utility is used with arguments, it validates all arguments and prompts for the password of the user having Administrator rights. If the utility is used without arguments, `ndsconfig` displays a description of the utility and available options. This utility can also be used to remove the eDirectory Replica Server and change the current configuration of eDirectory Server. For more information, see “[The ndsconfig Utility](#)” on [page 101](#).

Prerequisite for Configuring eDirectory in a Specific Locale

If you want to configure eDirectory in a specific locale, you need to export `LC_ALL` and `LANG` to that particular locale before eDirectory configuration. For example, to configure eDirectory in the Japanese locale, enter the following:

```
export LC_ALL=ja
```

```
export LANG=ja
```

Creating a New Tree

Use the following syntax:

```
ndsconfig new -t treename -n server context -a admin FDN [-i] [-S server name]  
[-d path for dib] [-m module] [e] [-L ldap port] [-l SSL port] [-o http port]  
[-O https port] [-b port to bind] [-B interface1@port1, interface2@port2,..]  
[-D custom_location] [--config-file configuration_file]
```

A new tree is installed with the specified tree name and context.

There is a limitation on the number of characters in the *tree_name*, *admin FDN* and *server FDN* variables. The maximum number of characters allowed for these variables is as follows:

- ♦ *tree_name*: 32 characters
- ♦ *admin FDN*: 256 characters
- ♦ *server FDN*: 256 characters

If the parameters are not specified in the command line, *ndsconfig* prompts you to enter values for each of the missing parameters.

Or, you can also use the following syntax:

```
ndsconfig def -t treename -n server context -a admin FDN [-i] [-S server name]
[-d path for dib] [-m module] [-e] [-L ldap port] [-l SSL port] [-o http port]
-O https port] [-D custom_location] [--config-file configuration_file]
```

A new tree is installed with the specified tree name and context. If the parameters are not specified in the command line, *ndsconfig* takes the default value for each of the missing parameters.

For example, to create a new tree, you could enter the following command:

```
ndsconfig new -t corp-tree -n o=company -a cn=admin.o=company
```

Adding a Server into an Existing Tree

Use the following syntax:

```
ndsconfig add -t treename -n server context -a admin FDN [-e] [-L ldap port] [-l
SSL port] [-o http port] -O https port] [-S server name] [-d path for dib] [-p
IP address:port] [-m module] [-b port to bind] [-B interface1@port1,
interface2@port2,...] [-D custom_location] [--config-file configuration_file]
[-E]
```

A server is added to an existing tree in the specified context. If the context that the user wants to add the Server object to does not exist, *ndsconfig* creates the context and adds the server.

LDAP and security services can also be added after eDirectory has been installed into the existing tree.

For example, to add a server into an existing tree, you could enter the following command:

```
ndsconfig add -t corp-tree -n o=company -a cn=admin.o=company -S srv1
```

You can enable encrypted replication in the server you want to add using the *-E* option. For more information on encrypted replication, refer to *Novell eDirectory 8.8 Administration Guide* (<http://www.novell.com/documentation/edir88/index.html>).

Removing a Server Object and Directory Services from a Tree

Use the following syntax:

```
ndsconfig rm -a admin FDN
```

eDirectory and its database are removed from the server.

NOTE: The HTML files created using iMonitor will not be removed. You must manually remove these files from `/var/opt/novell/eDirectory/data/dsreports` before removing eDirectory.

For example, to remove the eDirectory Server object and directory services from a tree, you could enter the following command:

```
ndsconfig rm -a cn=admin.o=company
```

ndsconfig Utility Parameters

Refer to [“ndsconfig Utility Parameters” on page 28](#) for more information.

2.6.7 Using ndsconfig to Configure Multiple Instances of eDirectory 8.8

You can configure multiple instances of eDirectory 8.8 on a single host. For information on multiple instances, refer to [Section 1.6.5, “Using ndsconfig to Configure Multiple Instances of eDirectory 8.8,” on page 31](#) in the Linux chapter.

2.6.8 Using Ndsconfig to Install a Solaris Server into a Tree with Dotted Name Containers

You can use ndsconfig to install a Solaris server into an eDirectory tree that has containers using dotted names (for example, novell.com).

Because ndsconfig is a command line utility, using containers with dotted names requires that those dots be escaped out, and the parameters containing these contexts must be enclosed in double quotes. For example, to install a new eDirectory tree on a Solaris server using “O=novell.com” as the name of the O, use the following command:

```
ndsconfig new -a "admin.novell\.com" -t novell_tree -n  
"OU=servers.O=novell\.com"
```

The Admin name and context and the server context parameters are enclosed in double quotes, and only the dot (‘.’) in novell.com is escaped using the ‘\’ (backslash) character.

You can also use this format when installing a server into an existing tree.

NOTE: You should use this format when entering dotted admin name and context while using utilities such as ndsrepair, ndsbackup, ndsmmerge, ndslogin, and ldapconfig.

2.6.9 Using the Nmasinst Utility to Configure NMAS

For eDirectory 8.8, by default, ndsconfig configures NMAS. You can also use nmasinst on Linux, Solaris, and AIX systems to configure NMAS.

ndsconfig only configures NMAS and does not install the login methods. To install these login methods, you can use nmasinst.

IMPORTANT: You must configure eDirectory with ndsconfig before you install the NMAS login methods. You must also have administrative rights to the tree.

- ♦ [“Configuring NMAS” on page 54](#)
- ♦ [“Installing Login Methods” on page 54](#)

Configuring NMAS

By default, ndsconfig configures NMAS. You can also use nmasinst for the same.

To configure NMAS and create NMAS objects in eDirectory, enter the following at the server console command line:

```
nmasinst -i admin.context tree_name
```

nmasinst will prompt you for a password.

This command creates the objects in the Security container that NMAS needs, and installs the LDAP extensions for NMAS on the LDAP Server object in eDirectory.

The first time NMAS is installed in a tree, it must be installed by a user with enough rights to create objects in the Security container. However, subsequent installs can be done by container administrators with read-only rights to the Security container. nmasinst will verify that the NMAS objects exist in the Security container before it tries to create them.

nmasinst does not extend the schema. The NMAS schema is installed as part of the base eDirectory schema.

Installing Login Methods

To install login methods using nmasinst, enter the following at the server console command line:

```
nmasinst -addmethod admin.context tree_name config.txt_path
```

The last parameter specifies the config.txt file for the login method that is to be installed. A config.txt file is provided with each login method.

Here is an example of the -addmethod command:

```
nmasinst -addmethod admin.novell MY_TREE ./nmas-methods/novell/Simple  
Password/config.txt
```

If the login method already exists, nmasinst will update it.

For more information, see [“Managing Login and Post-Login Methods and Sequences” \(http://www.novell.com/documentation/beta/nmas30/admin/data/a53vj9a.html\)](http://www.novell.com/documentation/beta/nmas30/admin/data/a53vj9a.html) in the *Novell Modular Authentication Service Administration Guide*.

2.6.10 Nonroot user SNMP configuration

NICI and NOVLsubag should be installed as root user.

- 1 Root User Installing NICI. Refer to [“Root User Installing NICI” on page 23](#).
- 2 Install NOVLsubag as root.

3 Export the paths as follows:

Manually export the environment variables.

32-bit: export LD_LIBRARY_PATH=*custom_location/opt/novell/eDirectory/lib:custom_location/opt/novell/lib:/opt/novell/lib:/*

opt/novell/eDirectory/lib:\$LD_LIBRARY_PATH

64-bit: export LD_LIBRARY_PATH=*custom_location/opt/novell/ eDirectory/lib/sparcv9:custom_location/opt/novell/lib/sparcv9:/opt/novell/lib/sparcv9:/opt/novell/eDirectory/lib/sparcv9:\$LD_LIBRARY_PATH*

export PATH=*/opt/novell/eDirectory/bin:\$PATH*

export MANPATH=*/opt/novell/man:\$MANPATH*

Installing or Upgrading Novell eDirectory on AIX

3

Use the following information to install or upgrade Novell eDirectory 8.8 on an AIX server:

- ♦ [Section 3.1, “System Requirements,” on page 57](#)
- ♦ [Section 3.2, “Prerequisites,” on page 57](#)
- ♦ [Section 3.3, “Hardware Requirements,” on page 59](#)
- ♦ [Section 3.4, “Forcing the Backlink Process to Run,” on page 59](#)
- ♦ [Section 3.5, “Upgrading eDirectory,” on page 60](#)
- ♦ [Section 3.6, “Installing eDirectory,” on page 60](#)

3.1 System Requirements

- ☐ AIX V5.3
- ☐ AIX V6.1
- ☐ All recommended AIX OS patches, available at the [IBM* Tech Support \(https://techsupport.services.ibm.com/server/fixes\)](https://techsupport.services.ibm.com/server/fixes) Web site
- ☐ A minimum of 512 MB RAM
- ☐ 215 MB of disk space for the eDirectory server
- ☐ 38 MB of disk space for the eDirectory administration utilities
- ☐ 150 MB of disk space for every 50,000 users

3.2 Prerequisites

IMPORTANT: Check the currently installed Novell and Third Party applications to determine if eDirectory 8.8 is supported before upgrading your existing eDirectory environment. You can find out the current status for Novell products in the [TID - What Novell products are supported with Novell eDirectory 8.8? \(http://www.novell.com/support/php/search.do?cmd=displayKC&docType=kc&externalId=7003446&sliceId=1&docTypeID=DT_TID_1_1&dialogID=65754231&stateId=0%200%2065752376\)](http://www.novell.com/support/php/search.do?cmd=displayKC&docType=kc&externalId=7003446&sliceId=1&docTypeID=DT_TID_1_1&dialogID=65754231&stateId=0%200%2065752376). You are highly recommended to back up eDirectory before any upgrades.

- ☐ Enable the AIX host for multicast routing.

See if the multicast routing daemon `mROUTED` is running.

If it is not running, configure and start the multicast daemon `mROUTED`.

See the “`mROUTED.conf` File” section in the *Files Reference* book in [AIX Documentation \(http://www16.boulder.ibm.com/pseries/en_US/infocenter/base/aix.htm\)](http://www16.boulder.ibm.com/pseries/en_US/infocenter/base/aix.htm) for an example configuration file.

- ❑ (Conditional) NCI 2.7 and eDirectory 8.8 support key sizes up to 4096 bits. If you want to use a 4 KB key size, every server must be upgraded to eDirectory 8.8. In addition, every workstation using the management utilities, for example, iManager and ConsoleOne, must have NCI 2.7 installed on it.

When you upgrade your Certificate Authority (CA) server to eDirectory 8.8, the key size will not change; it will be 2 KB. The only way to create a 4 KB key size is recreate the CA on an eDirectory 8.8 server. In addition, you would have to change the default from 2 KB to 4 KB for the key size, during the CA creation.

The package containing NCI 2.7 is named `NOVLnu0-2.7` on AIX. For more information, refer to [“Installing NCI” on page 64](#).

- ❑ If you have more than one server in the tree, the time on all the network servers should be synchronized.

Use Network Time Protocol's (NTP) `xntpd.nlm` to synchronize time.

- ❑ (Conditional) If you are installing a secondary server, all the replicas in the partition that you install the product on should be in the On state.
- ❑ (Conditional) If you are installing a secondary server into an existing tree as a nonadministrator user, ensure that you have the following rights:
 - ◆ Supervisor rights to the container the server is being installed into.
 - ◆ Supervisor rights to the partition where you want to add the server.

NOTE: This is required for adding the replica when the replica count is less than 3.

- ◆ All Attributes rights: read, compare, and write rights over the `W0.KAP.Security` object.
 - ◆ Entry rights: browse rights over Security container object.
 - ◆ All Attributes rights: read and compare rights over Security container object.
- ❑ (Conditional) If you are installing a secondary server into an existing tree as a nonadministrator user, ensure that at least one of the servers in the tree has the same or higher eDirectory version as that of the secondary being added as container admin. In case the secondary being added is of later version, then the schema needs to be extended by the admin of the tree before adding the secondary using container admin.
 - ❑ While configuring eDirectory, you must enable SLP services and an NCPTM port (the default is 524) in the firewall to allow the secondary server addition. Additionally, you can enable the following service ports based on your requirements:
 - ◆ LDAP clear text - 389
 - ◆ LDAP secured - 636
 - ◆ HTTP clear text - 8028
 - ◆ HTTP secured - 8030

In case, if you have enabled user-defined ports, you must mention these ports while configuring eDirectory.

- ❑ During eDirectory upgrade, if SecretStore has not already been configured with the previous versions, or you do not want to configure SecretStore, use the `-m no_ss` option with the `nds-install` utility.

Configuring Static IP Address

Static IP address must be configured on the server for the eDirectory to perform efficiently. Configuring eDirectory on the servers with DHCP address can lead to unpredictable results.

3.3 Hardware Requirements

Hardware requirements depend on the specific implementation of eDirectory.

For example, a base installation of Novell eDirectory with the standard schema requires about 74 MB of disk space for every 50,000 users. However, if you add a new set of attributes or completely fill in every existing attribute, the object size grows. These additions affect the disk space, processor, and memory needed.

Two factors increase performance: more cache memory and faster processors.

For best results, cache as much of the DIB Set as the hardware allows.

eDirectory scales well on a single processor. However, eDirectory 8.8 takes advantage of multiple processors. Adding processors improves performance in some areas—for example, logins and having multiple threads active on multiple processors. eDirectory itself is not processor intensive, but it is I/O intensive.

The following table illustrates typical system requirements for Novell eDirectory for AIX.

Objects	Processor	Memory	Hard Disk
100,000	RS/6000	344 MB	144 MB
1 Million	RS/6000	2 GB	1.5 GB
10 Million	RS/6000	2+ GB	15 GB

Requirements for processors might be greater than the table indicates, depending upon additional services available on the computer as well as the number of authentications, reads, and writes that the computer is handling. Processes such as encryption and indexing can be processor intensive.

3.4 Forcing the Backlink Process to Run

Because the internal eDirectory identifiers change when upgrading to Novell eDirectory, the backlink process must update backlinked objects for them to be consistent.

Backlinks keep track of external references to objects on other servers. For each external reference on a server, the backlink process ensures that the real object exists in the correct location and verifies all backlink attributes on the master of the replica. The backlink process occurs two hours after the database is open, and then every 780 minutes (13 hours). The interval is configurable from 2 minutes to 10,080 minutes (7 days).

After migrating to eDirectory, start the ndstrace process by issuing the `ndstrace -l>log&` command, which runs the process at the background. You can force the backlink to run by issuing the `ndstrace -c set ndstrace=*B` command from the ndstrace command prompt. Then you can unload the ndstrace process by issuing the `ndstrace -u` command. Running the backlink process is especially important on servers that do not contain a replica.

3.5 Upgrading eDirectory

To upgrade to eDirectory 8.8 from eDirectory 8.7, 8.7.1, or 8.7.3, enter the following:

```
./nds-install
```

After the upgrade to eDirectory 8.8, the default location of the configuration files, data files, and log files are changed to `/etc/opt/novell/eDirectory/conf`, `/var/opt/novell/eDirectory/data`, and `/var/opt/novell/eDirectory/log` respectively.

The new directory `/var/opt/novell/eDirectory/data` uses a symbolic link to the `/var/nds` directory.

The old configuration file `/etc/nds.conf` is migrated to `/etc/opt/novell/eDirectory/conf` directory. The old configuration file `/etc/nds.conf` is renamed to `/etc/nds.conf_pre88` and the old log files under `/var/nds` are retained for reference.

NOTE: "ndsconfuiig upgrade" has to be run after `nds-install`, if upgrade of the DIB fails and `nds-install` asks to do so.

NOTE: Health check fails due to time sync. To resolve this issue, perform a time sync between the instances. You can ignore this warning message during upgrade.

3.5.1 Upgrading Multiple Instances

For information on Upgrading Multiple Instances, refer to [Section 1.5.7, “Upgrading Multiple Instances,”](#) on page 18 in the Linux chapter.

3.5.2 Upgrading the Tarball Deployment of eDirectory 8.8

For information on Upgrading the Tarball Deployment of eDirectory 8.8, refer to [Section 1.5.6, “Upgrading the Tarball Deployment of eDirectory 8.8,”](#) on page 16 in the Linux chapter.

3.6 Installing eDirectory

The following sections provide information about installing Novell eDirectory on AIX:

- ♦ [Section 3.6.1, “Server Health Checks,”](#) on page 61
- ♦ [Section 3.6.2, “Using SLP with eDirectory,”](#) on page 61
- ♦ [Section 3.6.3, “Using the nds-install Utility to Install eDirectory Components,”](#) on page 62
- ♦ [Section 3.6.4, “Nonroot User Installing eDirectory 8.8,”](#) on page 64
- ♦ [Section 3.6.5, “Using the Ndsconfig Utility to Add or Remove the eDirectory Replica Server,”](#) on page 67
- ♦ [Section 3.6.6, “Using ndsconfig to Configure Multiple Instances of eDirectory 8.8,”](#) on page 69
- ♦ [Section 3.6.7, “Using Ndsconfig to Install an AIX Server into a Tree with Dotted Name Containers,”](#) on page 69
- ♦ [Section 3.6.8, “Using the Nmasinst Utility to Configure NMAS,”](#) on page 69
- ♦ [Section 3.6.9, “nonroot user SNMP configuration,”](#) on page 70

3.6.1 Server Health Checks

With eDirectory 8.8, when you upgrade or install eDirectory, two server health checks are conducted by default to ensure that the server is safe for the upgrade.

- ♦ [Section B.3.1, “Basic Server Health,” on page 138](#)
- ♦ [Section B.3.2, “Partitions and Replica Health,” on page 139](#)

Based on the results obtained from the health checks, the upgrade will either continue or exit as follows:

- ♦ If all the health checks are successful, the upgrade will continue.
- ♦ If there are minor errors, the upgrade will prompt you to continue or exit.
- ♦ If there are critical errors, the upgrade will exit.

See [Appendix B, “eDirectory Health Checks,” on page 137](#) for a list of minor and critical error conditions.

Skipping Server Health Checks

To skip server health checks, use `nds-install -j` or `ndsconfig upgrade -j`.

For more information, see [Appendix B, “eDirectory Health Checks,” on page 137](#).

3.6.2 Using SLP with eDirectory

In earlier releases of eDirectory, SLP was installed during the eDirectory install. But with eDirectory 8.8, you need to separately install SLP before proceeding with the eDirectory install.

If you plan to use SLP to resolve tree names, it should have been properly configured and SLP DAs should be stable.

- 1 Install SLP using the following command:

```
installp -acgXd absolute_path_of_NDSslp_fileset NDS.NDSslp
```

The SLP fileset is present in the setup directory in the build. For example, if you have the build in the `/home/build` directory, enter the following command:

```
installp -acgXd /home/build/Aix/Aix/setup/NDS.NDSslp
```

- 2 Follow the onscreen instructions to complete the SLP installation.
- 3 Start SLP.

If you don't want to (or cannot) use SLP, you can use the flat file `hosts.nds` to resolve tree names to server referrals. The `hosts.nds` file can be used to avoid SLP multicast delays when a SLP DA is not present in the network.

`hosts.nds` is a static lookup table used by eDirectory applications to search eDirectory partition and servers. The `hosts.nds` file should be created in `/etc/opt/novell/eDirectory/conf/hosts.nds` or `<custom_location>/etc/opt/novell/eDirectory/conf/hosts.nds`. For more information on `hosts.nds`, refer to [“Using SLP with eDirectory” on page 19](#) and the `hosts.nds` manpage.

If you decide to use SLP to resolve the tree name to determine if the eDirectory tree is advertised, after eDirectory and SLP are installed, enter the following:

```
/usr/bin/slpinfo -s "ndap.novell///(svcname-ws==[treename or *])"
```

For example, to search for the services whose svcname-ws attribute match with the value SAMPLE_TREE, enter the following command:

```
/usr/bin/slpinfo -s "ndap.novell///(svcname-ws==SAMPLE_TREE)/"
```

If you have a service registered with its svcname-ws attribute as SAMPLE_TREE, then the output will be similar to the following:

```
service:ndap.novell:///SAMPLE_TREE
```

If you do not have a service registered with its svcname-ws attribute as SAMPLE_TREE, there will be no output.

For more information, see [Appendix C, “Configuring OpenSLP for eDirectory,” on page 143](#).

3.6.3 Using the nds-install Utility to Install eDirectory Components

Use the nds-install utility to install eDirectory components on AIX systems. This utility is located in the Setup directory on the CD for the AIX platform. The utility adds the required packages based on what components you choose to install.

- 1 Enter the following command from the setup directory:

```
./nds-install
```

To install eDirectory components, use the following syntax:

```
nds-install [-h] [-i] [-j] [-u]
```

If you do not provide the required parameters in the command line, the nds-install utility will prompt you for the parameters.

The following table provides a description of the nds-install utility parameters:

nds-install Parameter	Description
-h	Displays help for nds-install.
-i	Prevents the nds-install script from invoking ndsconfig upgrade if a DIB is detected at the time of the upgrade.
-j	Jumps or overrides the health check option before installing eDirectory. For more information about health checks, refer to Appendix B, “eDirectory Health Checks,” on page 137 .
-m	Specifies the module name to configure. While configuring a new tree, you can configure only the ds module. After configuring the ds module, you can add the NMAS, LDAP, SAS, SNMP, HTTP services, and Novell SecretStore (ss) using the add command. If the module name is not specified, all the modules are installed.
-u	Specifies the option to use an unattended install mode.

The installation program installs the following depots:

eDirectory Component	Packages Installed	Description
eDirectory Server	NDSbase NDScommon NDSmasv NDSserv NDSimon NDSrepair NDSdexvnt NOVLsubag NOVLsnmp NOVLpkit NOVLpkis NOVLpkia NOVLembox NOVLimgnt NOVLxis NLDAPsdk NLDAPbase NOVLsas NOVLntls NOVLnmas NOVLdif2dib NOVLncp	The eDirectory replica server is installed on the specified server.
Administration Utilities	NOVLice NDSbase NLDAPbase NLDAPsdk NOVLpkia NOVLxis NOVLimgnt	The Novell Import Conversion Export and LDAP Tools administration utilities are installed on the specified workstation.

2 If you are prompted, enter the complete path to the license file.

You will be prompted to enter the complete path to the license file only if the installation program cannot locate the file in the default location (/var, the mounted license diskette, or the current directory).

If the path you entered is not valid, you will be prompted to enter the correct path.

You can use the ndsconfig utility to configure eDirectory Server after installation.

Novell Modular Authentication Service (NMAS) is installed as part of the server component. By default ndsconfig configures NMAS. You can also use the nmasinst utility to configure NMAS server after installation. This must be done after configuring eDirectory with ndsconfig.

For more information on the ndsconfig utility, see [“The ndsconfig Utility” on page 101](#).

For more information on the nmasinst utility, see [“Using the Nmasinst Utility to Configure NMAS” on page 69](#).

3 After the installation is complete, you need to update the following environment variables and export them as follows:

♦ **Manually export the environment variables**

```
export LD_LIBRARY_PATH=/opt/novell/eDirectory/lib:/opt/novell/
eDirectory/lib/nds-modules:/opt/novell/lib:/opt/novell/lib:/opt/
novell/eDirectory/lib:$LD_LIBRARY_PATH
```

```
export LIBPATH=/opt/novell/eDirectory/lib:/opt/novell/eDirectory/lib/nds-
modules:/opt/novell/lib:/opt/novell/lib:/opt/novell/eDirectory/lib:$LIBPATH

export PATH=/opt/novell/eDirectory/bin:/opt/novell/eDirectory/
sbin:$PATH

export MANPATH=/opt/novell/man:/opt/novell/eDirectory/man:$MANPATH

export TEXTDOMAINDIR=/opt/novell/eDirectory/share/
locale:$TEXTDOMAINDIR
```

- ♦ **Use the ndspath script to export the environment variables**

If you do not want to export the paths manually, you can use the `/opt/novell/eDirectory/bin/ndspath` script as follows:

- ♦ Prefix the ndspath script to the utility and run the utility you want as follows:

```
/opt/novell/eDirectory/bin/ndspath utility_name_with_parameters
```

- ♦ Export the paths in the current shell as follows:

```
. /opt/novell/eDirectory/bin/ndspath
```

After entering the above command, run the utilities as you would normally do.

- ♦ Call the script in your profile, `bashrc`, or similar scripts. Therefore, whenever you log in or open a new shell, you can start using the utilities directly.

3.6.4 Nonroot User Installing eDirectory 8.8

A nonroot user can install eDirectory 8.8 using the tarball.

Prerequisites

- ❑ Ensure that NCI is installed.

For information on installing NCI, refer to [“Installing NCI” on page 64](#).

- ❑ If you want to use SLP and SNMP, ensure that they are installed by the root user.
- ❑ Write rights to the directory where you want to install eDirectory.

If you are a nonadministrator user, ensure that you have the appropriate rights as mentioned in the [Section 3.2, “Prerequisites,” on page 57](#) section.

Installing NCI

NCI should be installed before you proceed with the eDirectory installation. Both root and nonroot users can install NCI, though the procedure to do so is different.

Root User Installing NCI

To install NCI, complete the following procedure:

- 1 Enter the following command:

```
installp -acgXd absolute_path_of_the_NCI_fileset NOVLniu0
```

For example:

```
installp -acgXd /home/build/AIX/AIX/setup/NOVLniu0.2.7.0.0 NOVLniu0
```


- 2 Execute the following script:

```
/var/opt/novell/nici/set_server_mode
```

Nonroot User Installing NCI

Nonroot users can make use of the sudo utility to install NCI. Sudo (superuser do) allows a root user to give certain users the ability to run some commands as root. A root user can do this by editing the `/etc/sudoers` configuration file and adding appropriate entries in it.

For more information, refer to the [sudo Website \(http://www.sudo.ws/\)](http://www.sudo.ws/).

WARNING: sudo enables you to give limited root permissions to nonroot users. Therefore, you must understand the security implications before proceeding.

A root user needs to complete the following procedure to enable a nonroot user (for example, john) to install NCI:

- 1 Log in as root.
- 2 Edit the `/etc/sudoers` configuration file using the visudo command.

NOTE: There is no space between vi and sudo in the command.

Make an entry with the following information:

```
Username    hostname=(root) NOPASSWD: /usr/sbin/installp
```

For example, to enable john to run `/bin/rpm` as root on the hostname `aix-2`, type the following:

```
john       aix-2=(root) NOPASSWD: /usr/sbin/installp
```

A nonroot user (john in the example) needs to do the following to install NCI:

- 1 Log in as john and execute the following command:

```
sudo installp -acgXd absolute_path_of_the_NCI_fileset NOVLniu0
```

For example:

```
sudo installp -acgXd /home/build/AIX/AIX/setup/NOVLniu0.2.7.0.0 NOVLniu0
```

- 2 Execute the following script:

```
sudo /var/opt/novell/nici/set_server_mode
```

NCI gets installed in the server mode.

Installing eDirectory

- 1 Go to the directory where you want to install eDirectory.
- 2 Untar the tar file as follows:

```
tar xvpf /tar_file_name
```

- 3 Export the paths as follows:

- ♦ **Manually export the environment variables**

```
export LD_LIBRARY_PATH=custom_location/eDirectory/opt/novell/eDirectory/
lib:custom_location/eDirectory/opt/novell/eDirectory/lib/nds-
modules:custom_location/eDirectory/opt/novell/lib:/opt/novell/lib:/opt/
novell/eDirectory/lib:$LD_LIBRARY_PATH

export LIBPATH=custom_location/eDirectory/opt/novell/eDirectory/
lib:custom_location/eDirectory/opt/novell/eDirectory/lib/nds-
modules:custom_location/eDirectory/opt/novell/lib:/opt/novell/lib:/opt/
novell/eDirectory/lib:$LIBPATH

export PATH=custom_location/eDirectory/opt/novell/eDirectory/
bin:custom_location/eDirectory/opt/novell/eDirectory/sbin:/opt/novell/
eDirectory/bin:$PATH

export MANPATH=custom_location/eDirectory/opt/novell/man:custom_location/
eDirectory/opt/novell/eDirectory/man:$MANPATH

export TEXTDOMAINDIR=custom_location/eDirectory/opt/novell/eDirectory/share/
locale:$TEXTDOMAINDIR
```

- ♦ **Use the ndspath script to export the environment variables**

If you do not want to export the paths manually, you can use the *custom_location/eDirectory/opt/novell/eDirectory/bin/ndspath* script as follows:

- ♦ Prefix the ndspath script to the utility and run the utility you want as follows:

```
custom_location/eDirectory/opt/novell/eDirectory/bin/ndspath
utility_name_with_parameters
```

- ♦ Go to the *custom_location/eDirectory/opt/novell/eDirectory/bin/* directory and export the paths in the current shell as follows:

```
. custom_location/eDirectory/opt/novell/eDirectory/bin/ndspath
```

NOTE: Ensure that you enter the above command from the *custom_location/eDirectory/opt* directory.

After entering the above command, run the utilities as you would normally do.

- ♦ Call the script in your profile, *bashrc*, or similar scripts. Therefore, whenever you log in or open a new shell, you can start using the utilities directly.

4 Configure eDirectory in the usual manner.

You can configure eDirectory in any of the following ways:

- ♦ Use the *ndsconfig* utility as follows:

```
ndsconfig new -t treename -n server_context -a admin_FDN [-i] [-S
server_name] [-d path_for_dib] [-m module] [e] [-L ldap_port] [-l
SSL_port] [-o http_port] -O https_port [-b port_to_bind] [-B
interface1@port1, interface2@port2,...] [-D custom_location] [--config-
file configuration_file]
```

For example:

```
ndsconfig new -t mary-tree -n novell -a admin.novell -S linux1 -d /
home/mary/inst1/data -b 1025 -L 1026 -l 1027 -o 1028 -O 1029 -D /home/
mary/inst1/var --config-file /home/mary/inst1/nds.conf
```

The port numbers you enter need to be in the range 1024 to 65535. Port numbers lesser than 1024 are normally reserved for the super-user and standard applications. Therefore, you cannot assume the default port 524 for any eDirectory applications.

This might cause the following applications to break:

- ♦ The applications that don't have an option to specify the target server port.
- ♦ The older applications that use NCP, and are run as root for 524.
- ♦ Use the `ndsmanage` utility to configure a new instance. For more information, refer to the [“Creating an Instance through ndsmanage” on page 33](#).

Follow the onscreen instructions to complete the configuration.

For more information, see [Section 3.6.5, “Using the Ndsconfig Utility to Add or Remove the eDirectory Replica Server,” on page 67](#).

3.6.5 Using the Ndsconfig Utility to Add or Remove the eDirectory Replica Server

You must have Administrator rights to use the `ndsconfig` utility. When this utility is used with arguments, it validates all arguments and prompts for the password of the user having Administrator rights. If the utility is used without arguments, `ndsconfig` displays a description of the utility and available options. This utility can also be used to remove the eDirectory Replica Server and change the current configuration of eDirectory Server. For more information, see [“The ndsconfig Utility” on page 101](#).

Prerequisite for Configuring eDirectory in a Specific Locale

If you want to configure eDirectory in a specific locale, you need to export `LC_ALL` and `LANG` to that particular locale before eDirectory configuration. For example, to configure eDirectory in the Japanese locale, enter the following:

```
export LC_ALL=ja
```

```
export LANG=ja
```

Creating a New Tree

Use the following syntax:

```
ndsconfig new -t treename -n server context -a admin FDN [-i] [-S server name]  
[-d path for dib] [-m module] [e] [-L ldap port] [-l SSL port] [-o http port]  
-O https port]
```

A new tree is installed with the specified tree name and context.

There is a limitation on the number of characters in the *tree_name*, *admin FDN* and *server FDN* variables. The maximum number of characters allowed for these variables is as follows:

- ♦ *tree_name*: 32 characters
- ♦ *admin FDN*: 256 characters
- ♦ *server FDN*: 256 characters

If the parameters are not specified in the command line, `ndsconfig` prompts you to enter values for each of the missing parameters.

Or, you can also use the following syntax:

```
ndsconfig def -t treename -n server context -a admin FDN [-i] [-S server name]
[-d path for dib] [-m module] [-e] [-L ldap port] [-l SSL port] [-o http port]
-O https port]
```

A new tree is installed with the specified tree name and context. If the parameters are not specified in the command line, ndsconfig takes the default value for each of the missing parameters.

For example, to create a new tree, you could enter the following command:

```
ndsconfig new -t corp-tree -n o=company -a cn=admin.o=company
```

Adding a Server into an Existing Tree

Use the following syntax:

```
ndsconfig add -t treename -n server context -a admin FDN [-e] [-L ldap port] [-l
SSL port] [-o http port] -O https port] [-S server name] [-d path for dib] [-p
IP address:port] [-m module] [-E]
```

A server is added to an existing tree in the specified context. If the context that the user wants to add the Server object to does not exist, ndsconfig creates the context and adds the server.

LDAP and security services can also be added after eDirectory has been installed into the existing tree.

For example, to add a server into an existing tree, you could enter the following command:

```
ndsconfig add -t corp-tree -n o=company -a cn=admin.o=company -S srv1
```

You can enable encrypted replication in the server you want to add using the -E option. For more information on encrypted replication, refer to *Novell eDirectory 8.8 Administration Guide* (<http://www.novell.com/documentation/edir88/index.html>).

Removing a Server Object and Directory Services from a Tree

Use the following syntax:

```
ndsconfig rm -a admin FDN
```

eDirectory and its database are removed from the server.

NOTE: The HTML files created using iMonitor will not be removed. You must manually remove these files from `/var/opt/novell/eDirectory/data/dsreports` before removing eDirectory.

For example, to remove the eDirectory Server object and directory services from a tree, you could enter the following command:

```
ndsconfig rm -a cn=admin.o=company
```

ndsconfig Utility Parameters

Refer to “[ndsconfig Utility Parameters](#)” on page 28 for more information.

3.6.6 Using ndsconfig to Configure Multiple Instances of eDirectory 8.8

You can configure multiple instances of eDirectory 8.8 on a single host. For information on multiple instances, refer to [Section 1.6.5, “Using ndsconfig to Configure Multiple Instances of eDirectory 8.8,” on page 31](#) in the Linux chapter.

3.6.7 Using Ndsconfig to Install an AIX Server into a Tree with Dotted Name Containers

You can use ndsconfig to install an AIX server into an eDirectory tree that has containers using dotted names (for example, novell.com).

Because ndsconfig is a command line utility, using containers with dotted names requires that those dots be escaped out, and the parameters containing these contexts must be enclosed in double quotes. For example, to install a new eDirectory tree on an AIX server using “O=novell.com” as the name of the O, use the following command:

```
ndsconfig new -a "admin.novell\.com" -t novell_tree -n  
"OU=servers.O=novell\.com"
```

The Admin name and context and the server context parameters are enclosed in double quotes, and only the dot (‘.’) in novell.com is escaped using the ‘\’ (backslash) character.

You can also use this format when installing a server into an existing tree.

NOTE: You should use this format when entering dotted admin name and context while using utilities such as ndsrepair, ndsbackup, ndsmmerge, ndslogin, and ldapconfig.

3.6.8 Using the Nmasinst Utility to Configure NMAS

For eDirectory 8.8, by default, ndsconfig configures NMAS. You can also use nmasinst on Linux, Solaris, and AIX systems to configure NMAS.

Ndsconfig only configures NMAS and does not install the login methods. To install these login methods, you can use nmasinst.

IMPORTANT: You must configure eDirectory with ndsconfig before you install the NMAS login methods. You must also have administrative rights to the tree.

- ♦ [“Configuring NMAS” on page 69](#)
- ♦ [“Installing Login Methods” on page 70](#)

Configuring NMAS

By default, ndsconfig configures NMAS. You can also use nmasinst for the same.

To configure NMAS and create NMAS objects in eDirectory, enter the following at the server console command line:

```
nmasinst -i admin.context tree_name
```

nmasinst will prompt you for a password.

This command creates the objects in the Security container that NMAS needs, and installs the LDAP extensions for NMAS on the LDAP Server object in eDirectory.

The first time NMAS is installed in a tree, it must be installed by a user with enough rights to create objects in the Security container. However, subsequent installs can be done by container administrators with the Read-only right to the Security container. nmasinst will verify that the NMAS objects exist in the Security container before it tries to create them.

nmasinst does not extend the schema. The NMAS schema is installed as part of the base eDirectory schema.

Installing Login Methods

To install login methods using nmasinst, enter the following at the server console command line:

```
nmasinst -addmethod admin.context tree_name config.txt_path
```

The last parameter specifies the config.txt file for the login method that is to be installed. A config.txt file is provided with each login method.

Here is an example of the -addmethod command:

```
nmasinst -addmethod admin.novell MY_TREE ./nmas-methods/novell/Simple  
Password/config.txt
```

If the login method already exists, nmasinst will update it.

For more information, see “Managing Login and Post-Login Methods and Sequences” (<http://www.novell.com/documentation/beta/nmas30/admin/data/a53vj9a.html>) in the *Novell Modular Authentication Service Administration Guide*.

3.6.9 nonroot user SNMP configuration

NICI and NOVLSUBAG should be installed as root user.

- 1 Root User Installing NICI. Refer to “Root User Installing NICI” on page 64.
- 2 Install NOVLSUBAG as root.
- 3 Export the paths as follows:

Manually export the environment variables.

```
export LD_LIBRARY_PATH=custom_location/opt/novell/  
eDirectory/lib:custom_location/opt/novell/lib:/opt/novell/lib:/  
opt/novell/eDirectory/lib:$LD_LIBRARY_PATH
```

```
export PATH=/opt/novell/eDirectory/bin:$PATH  
export MANPATH=/opt/novell/:$MANPATH
```

Installing or Upgrading Novell eDirectory on Windows

4

Use the following information to install or upgrade Novell eDirectory 8.8 on a Windows platform:

- ♦ [Section 4.1, “System Requirements,” on page 71](#)
- ♦ [Section 4.2, “Prerequisites,” on page 72](#)
- ♦ [Section 4.3, “Hardware Requirements,” on page 73](#)
- ♦ [Section 4.4, “Forcing the Backlink Process to Run,” on page 74](#)
- ♦ [Section 4.5, “Disk Space Check on Upgrading to eDirectory SP6 or later,” on page 74](#)
- ♦ [Section 4.6, “Installing Novell eDirectory on Windows,” on page 74](#)

IMPORTANT: Novell eDirectory 8.8 lets you install eDirectory for Windows without the Novell Client. If you install eDirectory 8.8 on a machine already containing the Novell Client, eDirectory will use the existing Client. For more information, see [“Installing or Updating Novell eDirectory 8.8 on a Windows Server” on page 75](#).

4.1 System Requirements

- ☐ One of the following:

For a 32-bit eDirectory installation:

- ♦ 32-bit Windows 2003 Enterprise Server Latest Service Pack
- ♦ 32-bit Windows 2008 Server (Standard/Enterprise/Data Center Edition)

For a 64-bit eDirectory installation:

- ♦ 64-bit Windows 2008 Server (Standard/Enterprise/Data Center Edition)
- ♦ Windows 2008 R2 Server (Standard/Enterprise/Data Center Edition)

You can install eDirectory 8.8 SP6 on Windows 2008 R2 Server by running the `setup.exe` file only if you have administrative rights.

IMPORTANT: It is recommended to apply the latest available patch of eDirectory. Windows XP is not a supported Novell eDirectory 8.8 platform.

- ☐ An assigned IP address.
- ☐ Refer to the OS recommended hardware requirements
- ☐ (Optional) One or more workstations running one of the following:
 - ♦ Novell Client for Windows 2000 version 4.9
 - ♦ Novell Client for Windows XP version 4.9
- ☐ Administrative rights to the Windows server and to all portions of the eDirectory tree that contain domain-enabled User objects. For an installation into an existing tree, you need administrative rights to the Tree object so that you can extend the schema and create objects.

4.2 Prerequisites

IMPORTANT: Check the currently installed Novell and Third Party applications to determine if eDirectory 8.8 is supported before upgrading your existing eDirectory environment. You can find out the current status for Novell products in the [TID - What Novell products are supported with Novell eDirectory 8.8?](http://www.novell.com/support/php/search.do?cmd=displayKC&docType=kc&externalId=7003446&sliceId=1&docTypeID=DT_TID_1_1&dialogID=65754231&stateId=0%200%2065752376) (http://www.novell.com/support/php/search.do?cmd=displayKC&docType=kc&externalId=7003446&sliceId=1&docTypeID=DT_TID_1_1&dialogID=65754231&stateId=0%200%2065752376) It is also highly recommended to backup eDirectory prior to any upgrades.

- ❑ Because NTFS provides a safer transaction process than a FAT file system provides, you can install eDirectory only on an NTFS partition. Therefore, if you have only FAT file systems, do one of the following:
 - ◆ Create a new partition and format it as NTFS.
Use Disk Administrator. Refer to *Windows Server User Guide* for more information.
 - ◆ Convert an existing FAT file system to NTFS, using the CONVERT command.
Refer to *Windows Server User Guide* for more information.

If your server only has a FAT file system and you forget or overlook this process, the installation program prompts you to provide an NTFS partition.

- ❑ (Conditional) NCI 2.7 and eDirectory 8.8 support key sizes up to 4096 bits. If you want to use a 4 KB key size, every server must be upgraded to eDirectory 8.8. In addition, every workstation using the management utilities, for example, iManager and ConsoleOne, must have NCI 2.7 installed on it.

When you upgrade your Certificate Authority (CA) server to eDirectory 8.8, the key size will not change; it will be 2 KB. The only way to create a 4 KB key size is recreate the CA on an eDirectory 8.8 server. In addition, you would have to change the default from 2 KB to 4 KB for the key size, during the CA creation.

NOTE: The Windows Silent Installer requires NCI installed on the system.

- ❑ If you are upgrading to eDirectory 8.8, make sure you have the latest eDirectory patches installed on all non-eDirectory 8.8 servers in the tree. You can get eDirectory patches from the [Novell Support \(http://support.novell.com\)](http://support.novell.com) Web site.
- ❑ Make sure you have the latest Windows 2003 or 2008 Server Service Packs installed. The latest updated Windows Service Pack needs to be installed after the installation of the Windows SNMP service.
- ❑ If you are upgrading from a previous version of eDirectory, it must be eDirectory 8.7.3 or later.
- ❑ (Conditional) If you are installing a secondary server into an existing tree as a nonadministrator user, ensure that you have the following rights:
 - ◆ Supervisor rights to the container the server is being installed into.
 - ◆ Supervisor rights to the partition where you want to add the server.

NOTE: This is required for adding the replica when the replica count is less than 3.

- ◆ All Attributes rights: read, compare, and write rights over the W0.KAP.Security object.

- ♦ Entry rights: browse rights over Security container object.
 - ♦ All Attributes rights: read and compare rights over Security container object.
- ❑ (Conditional) If you are installing a secondary server into an existing tree as a nonadministrator user, ensure that at least one of the servers in the tree has the same or higher eDirectory version as that of the secondary being added as container admin. In case the secondary being added is of later version, then the schema needs to be extended by the admin of the tree before adding the secondary using container admin.
- ❑ While configuring eDirectory, you must enable SLP services and an NCP port (the default is 524) in the firewall to allow the secondary server addition. Additionally, you can enable the following service ports based on your requirements:
- ♦ LDAP clear text - 389
 - ♦ LDAP secured - 636
 - ♦ HTTP clear text - 8028
 - ♦ HTTP secured - 8030
- In case, if you have enabled user-defined ports, you must mention these ports while configuring eDirectory.
- ❑ If you are installing eDirectory on a virtual machine having a DHCP address or on a physical or virtual machine in which SLP is not broadcasted, ensure that the Directory Agent is configured in your network.

Configuring Static IP Address

Static IP address must be configured on the server for the eDirectory to perform efficiently. Configuring eDirectory on the servers with DHCP address can lead to unpredictable results.

4.3 Hardware Requirements

Hardware requirements depend on the specific implementation of eDirectory.

For example, a base installation of eDirectory with the standard schema requires about 74 MB of disk space for every 50,000 users. However, if you add a new set of attributes or completely fill in every existing attribute, the object size grows. These additions affect the disk space, processor, and memory needed.

Two factors increase performance: more cache memory and faster processors.

For best results, cache as much of the DIB Set as the hardware allows.

eDirectory scales well on a single processor. However, Novell eDirectory 8.8 takes advantage of multiple processors. Adding processors improves performance in some areas—for example, logins and having multiple threads active on multiple processors. eDirectory itself is not processor intensive, but it is I/O intensive.

The following table illustrates typical system requirements for Novell eDirectory for Windows:

Objects	Memory	Hard Disk
10,000	384 MB	144 MB
1 million	2 GB	1.5 GB

Objects	Memory	Hard Disk
10 million	2+ GB	15 GB

Requirements for processors depend on additional services available on the computer as well as the number of authentications, reads, and writes that the computer is handling. Processes such as encryption and indexing can be processor intensive.

4.4 Forcing the Backlink Process to Run

Because the internal eDirectory identifiers change when upgrading to eDirectory, the backlink process must update backlinked objects for them to be consistent.

Backlinks keep track of external references to objects on other servers. For each external reference on a server, the backlink process ensures that the real object exists in the correct location and verifies all backlink attributes on the master of the replica. The backlink process occurs two hours after the database is open and then every 780 minutes (13 hours). The interval is configurable from 2 minutes to 10,080 minutes (7 days).

After migrating to eDirectory, we recommend that you force the backlink to run by completing the following procedure. Running the backlink process is especially important on servers that do not contain a replica.

- 1 Click *Start > Settings > Control Panel > Novell eDirectory Services*
- 2 In the *Services* tab, select `ds.dlm`.
- 3 Click *Configure*.
- 4 In the *Trigger* tab, click *Backlinker*.

For more information about the backlink process, refer to the *Novell eDirectory 8.8 Administration Guide* (<http://www.novell.com/documentation/edir88/edir88/data/h0000005.html>).

4.5 Disk Space Check on Upgrading to eDirectory SP6 or later

When eDirectory server is upgraded from 8.7.x and 8.8 to eDirectory 8.8 SP6 or later, the disk space check for the DIB upgrade would be performed. The free disk space necessary in the file system, where the DIB resides would be equal to that of the DIB size. The messages of the disk space check would be updated in the `ni.log` and `<Install Path>/novell/nds/ndscheck.log`.

NOTE: The disk space check is required only during the DIB upgrade process. For more information, refer to [Chapter 6, “Upgrade Requirements of eDirectory 8.8,” on page 95](#).

4.6 Installing Novell eDirectory on Windows

This section contains the following information:

- ♦ [Section 4.6.1, “Installing or Updating Novell eDirectory 8.8 on a Windows Server,” on page 75](#)
- ♦ [Section 4.6.2, “Server Health Checks,” on page 76](#)
- ♦ [Section 4.6.3, “Communicating with eDirectory through LDAP,” on page 77](#)

- ♦ Section 4.6.4, “Installing NMAS Server Software,” on page 80
- ♦ Section 4.6.5, “Installing NMAS Client Software,” on page 80
- ♦ Section 4.6.6, “Installing into a Tree with Dotted Name Containers,” on page 80
- ♦ Section 4.6.7, “Unattended Install and Configure to eDirectory 8.8 SP6 on Windows,” on page 81

4.6.1 Installing or Updating Novell eDirectory 8.8 on a Windows Server

You can install eDirectory 8.8 for Windows without the Novell Client. If you install eDirectory 8.8 on a machine already containing the Novell Client, eDirectory will use the existing Client, or update it if it is not the latest version.

- 1 At the Windows server, log in as Administrator or as a user with administrative privileges.
- 2 To resolve tree names, make sure that SLP is correctly configured on your network and that SLP DAs are stable.

For more information, see one of the following:

- ♦ Appendix C, “Configuring OpenSLP for eDirectory,” on page 143.
 - ♦ DHCP Options for Service Location Protocol (<http://www.openslp.org/doc/rfc/rfc2610.txt>)
 - ♦ OpenSLP Documentation (<http://www.openslp.org/#Documentation>)
- 3 If you have Autorun turned off, run `setup.exe` from the `nt` folder (32-bit eDirectory) and `windows` folder (64-bit eDirectory) in the *Novell eDirectory 8.8 SP6* CD or from the downloaded file.

The installation program checks for the following components before it installs eDirectory. If a component is missing or is an incorrect version, the installation program automatically launches an installation for that component.

- ♦ NCI 2.7

For more information on the Novell International Cryptographic Infrastructure (NCI), see the *NCI 2.7 Administration Guide* (<http://www.novell.com/documentation/nici27x/index.html>).

You might have to reboot the server after the NCI installation. The eDirectory installation will continue after the reboot.

- ♦ Novell Client for Windows.

IMPORTANT: The Novell Client is updated automatically if you have an older version of the Client already installed on the machine. For more information on the Client, see the *Novell Client for Windows* (<http://www.novell.com/documentation/lg/noclienu/index.html>) online documentation.

- 4 View the license agreement, then click *I Accept*.
- 5 Select a language for the installation, then click *Next*.
- 6 Specify or confirm the installation path, then click *Next*.
- 7 Specify or confirm the DIB path, then click *Next*.

- 8 (New installations only) Select an eDirectory installation type, then click *Next*.
- ♦ **Install eDirectory into an Existing Tree** incorporates this server into your eDirectory network. The server can be installed into any level of your tree.
 - ♦ **Create a New eDirectory Tree** creates a new tree. Use this option if this is the first server to go into the tree or if this server requires a separate tree. The resources available on the new tree will not be available to users logged in to a different tree.
- 9 Provide information in the eDirectory Installation screen, then click *Next*.
- ♦ If you are installing a new eDirectory server, specify a Tree name, Server object context, and Admin name and password for the new tree.
 - ♦ If you are installing into an existing tree, specify the Tree name, Server object context, and Admin name and password of the existing tree.
 - ♦ If you are upgrading an eDirectory server, specify the Admin password.

NOTE: In eDirectory 8.8 and later, you can have case sensitive passwords for all the utilities. Refer to *Novell eDirectory 8.8 What's New Guide* (<http://www.novell.com/documentation/edir88/index.html>) for more information.

For information on using dots in container names, see “[Installing into a Tree with Dotted Name Containers](#)” on page 80.

- 10 (New installations only) In the HTTP Server Port Configuration page, specify the ports to use for the eDirectory administrative HTTP server, then click *Next*.

IMPORTANT: Make sure that the HTTP stack ports you set during the eDirectory installation are different than the HTTP stack ports you have used or will use for Novell iManager. For more information, see the *Novell iManager 2.6 Administration Guide* (<http://www.novell.com/documentation/imanager26/index.html>).

- 11 (New installations only) In the LDAP Configuration page, specify which LDAP ports to use, then click *Next*.

For more information, see “[Communicating with eDirectory through LDAP](#)” on page 77.

- 12 Perform the following and click *Next*.

12a Select the NMASTM login methods you want to install.

See “[Installing NMASTM Server Software](#)” on page 80 and “[Installing NMASTM Client Software](#)” on page 80 for more information.

12b Specify whether to configure the SecretStore module. By default, the SecretStore option is selected.

- 13 Click *Finish* to complete the eDirectory installation.

4.6.2 Server Health Checks

With eDirectory 8.8, when you upgrade eDirectory, a server health check is conducted by default to ensure that the server is safe for the upgrade.

- ♦ [Section B.3.2, “Partitions and Replica Health,” on page 139](#)

Based on the results obtained from the health checks, the upgrade will either continue or exit as follows:

- ♦ If all the health checks are successful, the upgrade will continue.
- ♦ If there are minor errors, the upgrade will prompt you to continue or exit.
- ♦ If there are critical errors, the upgrade will exit.

See [Appendix B, “eDirectory Health Checks,” on page 137](#) for a list of minor and critical error conditions.

Skipping Server Health Checks

To skip server health checks, disable server health checks when prompted in the installation wizard

For more information, see [Appendix B, “eDirectory Health Checks,” on page 137](#).

4.6.3 Communicating with eDirectory through LDAP

When you install eDirectory, you must select a port that the LDAP server monitors so that it can service LDAP requests. The following table lists options for various installations:

Installation	Option	Result
eDirectory 8.8	Clear text (port 389)	Selects port 389.
eDirectory 8.8	Encrypted (port 636)	Selects port 636.
eDirectory 8.8	Require TLS for simple bind	Keeps (on the LDAP Group object) a parameter asked about during installation.

Port 389, the Industry-Standard LDAP Clear-Text Port

The connection through port 389 is not encrypted. All data sent on a connection made to this port is clear. Therefore, a security risk exists. For example, LDAP passwords can be viewed on a simple bind request.

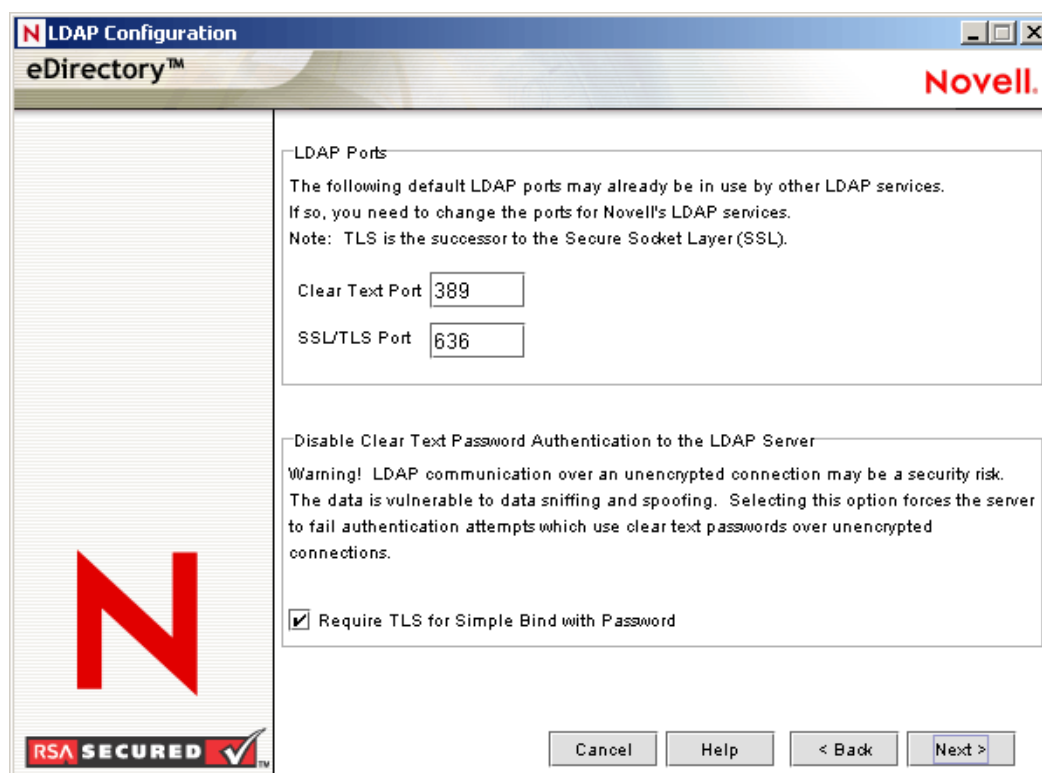
An LDAP Simple Bind requires only a DN and a password. The password is in clear text. If you use port 389, the entire packet is in clear text. By default, this option is disabled during the eDirectory installation.

Because port 389 allows clear text, the LDAP server services Read and Write requests to the Directory through this port. This openness is adequate for environments of trust, where spoofing doesn't occur and no one inappropriately captures packets.

To disallow clear passwords and other data, select the *Require TLS for Simple Bind with Password* option during installation.

As the following figure illustrates, the page gives defaults of 389, 636, and *Require TLS for Simple Bind with Password*.

Figure 4-1 Defaults for the LDAP Configuration Screen



Scenario: Require TLS for Simple Bind with Password Is Enabled: Olga is using a client that asks for a password. After Olga enters a password, the client connects to the server. However, the LDAP server does not allow the connection to bind to the server over the clear-text port. Everyone is able to view Olga's password, but Olga is unable to get a bound connection.

The *Require TLS for Simple Bind with Password* discourages users from sending observable passwords. If this setting is disabled (that is, not checked), users are unaware that others can observe their passwords. This option, which does not allow the connection, only applies to the clear-text port.

If you make a secure connection to port 636 and have a simple bind, the connection is already encrypted. No one can view passwords, data packets, or bind requests.

Port 636, the Industry-Standard Secure Port

The connection through port 636 is encrypted. TLS (formerly SSL) manages the encryption. By default, the eDirectory installation selects this port.

The following figure illustrates the selected port.

Figure 4-2 LDAP Server Connections Page in iManager

General

Information | **Connections** | Searches | Events | Tracing | Referrals

Transport Layer Security (TLS / SSL)

Server Certificate:

Client Certificate:

Trusted Root Containers:

☐ Require TLS for all operations

☒ Enable and require mutual authentication

Ports

☒ Enable Encrypted Port

Port:

☒ Enable Non-Encrypted Port

A connection to port 636 automatically instantiates a handshake. If the handshake fails, the connection is denied.

IMPORTANT: This default selection might cause a problem for your LDAP server. If a service already loaded on the host server (before eDirectory was installed) uses port 636, you must specify another port.

Installations earlier than eDirectory 8.7 treated this conflict as a fatal error and unloaded `nldap.nlm`. The eDirectory 8.7.3 onwards installation loads `nldap.nlm`, places an error message in the `dstrace.log` file, and runs without the secure port.

Scenario: Port 636 Is Already Used: Your server is running Active Directory*. Active Directory is running an LDAP program, which uses port 636. You install eDirectory. The installation program detects that port 636 is already used and doesn't assign a port number for the Novell LDAP server. The LDAP server loads and appears to run. However, because the LDAP server does not duplicate or use a port that is already open, the LDAP server does not service requests on any duplicated port.

If you are not certain that port 389 or 636 is assigned to the Novell LDAP server, run the ICE utility. If the *Vendor Version* field does not specify Novell, you must reconfigure LDAP Server for eDirectory and select a different port. See [Verifying That The LDAP Server Is Running \(http://www.novell.com/documentation/edir88/edir88/data/ai8wt35.html\)](http://www.novell.com/documentation/edir88/edir88/data/ai8wt35.html) in the *Novell eDirectory 8.8 Administration Guide* for more information.

Scenario: Active Directory Is Running: Active Directory is running. Clear-text port 389 is open. You run the ICE command to port 389 and ask for the vendor version. The report displays Microsoft*. You then reconfigure the Novell LDAP server by selecting another port, so that the eDirectory LDAP server can service LDAP requests.

Novell iMonitor can also report that port 389 or 636 is already open. If the LDAP server isn't working, use Novell iMonitor to identify details. See [Verifying That The LDAP Server Is Running \(http://www.novell.com/documentation/edir88/edir88/data/ai8wt35.html\)](http://www.novell.com/documentation/edir88/edir88/data/ai8wt35.html) in the *Novell eDirectory 8.8 Administration Guide* for more information.

4.6.4 Installing NMAS Server Software

Novell Modular Authentication Service (NMAS) server components are installed automatically when you run the eDirectory installation program. You will need to select the login methods you want to install.

Select the login methods that you want to install into eDirectory by checking the appropriate check boxes. When you select a login method, a description of the component appears in the *Description* box. For more information on login methods, see “[Managing Login and Post-Login Methods and Sequences](http://www.novell.com/documentation/nmas33/admin/?page=/documentation/nmas33/admin/data/a53vj9a.html)” (<http://www.novell.com/documentation/nmas33/admin/?page=/documentation/nmas33/admin/data/a53vj9a.html>) in the *Novell Modular Authentication Service Administration Guide*.

Click *Select All* if you want to install all the login methods into eDirectory. Click *Clear All* if you want to clear all selections.

The NDS login method is installed by default.

4.6.5 Installing NMAS Client Software

The NMAS client software must be installed on each client workstation where you want to use the NMAS login methods.

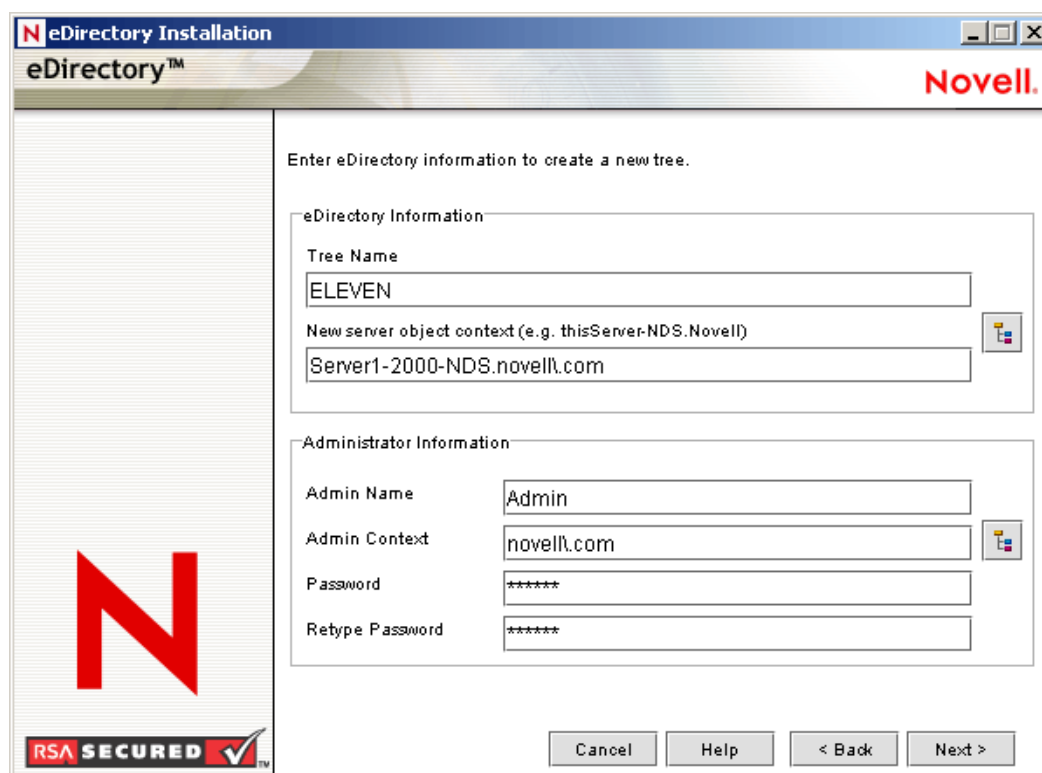
- 1 At a Windows client workstation, insert the *Novell eDirectory 8.8 CD*.
- 2 From the NMAS directory, run `nmasinstall.exe`.
- 3 Select the *NMAS Client Components* check box.
Optionally, you can select the *NICI* check box if you want to install this component.
- 4 Click *OK*, then follow the on-screen instructions.
- 5 Reboot the client workstation after the installation completes.

4.6.6 Installing into a Tree with Dotted Name Containers

You can install a Windows server into an eDirectory tree that has containers with dots in the names (for example, `O=novell.com` or `C=u.s.a`). Using containers with dotted names requires that those dots be escaped with the backslash character. To escape a dot, simply put a backslash in front of any dot in a container name. See [Figure 4-3](#) for an example.

You cannot start a name with a dot. For example, you cannot create a container named “.novell” because it starts with a dot (‘.’).

Figure 4-3 eDirectory Installation Information Screen



The screenshot shows the 'eDirectory Installation' window. The title bar says 'eDirectory Installation' and 'Novell.' is in the top right. The main area has a large red 'N' on the left and a form on the right. The form is titled 'Enter eDirectory information to create a new tree.' and contains two sections: 'eDirectory Information' and 'Administrator Information'. The 'eDirectory Information' section has fields for 'Tree Name' (containing 'ELEVEN') and 'New server object context (e.g. thisServer-NDS.Novell)' (containing 'Server1-2000-NDS.novell.com'). The 'Administrator Information' section has fields for 'Admin Name' (containing 'Admin'), 'Admin Context' (containing 'novell.com'), 'Password' (containing '*****'), and 'Retype Password' (containing '*****'). At the bottom are buttons for 'Cancel', 'Help', '< Back', and 'Next >'. An 'RSA SECURED' logo is in the bottom left corner.

IMPORTANT: If your tree has containers with dotted names, you must escape those names when logging into utilities such as iMonitor, iManager, and DHost iConsole. For example, if your tree has “novell.com” as the name of the O, enter `username.novell\.` in the *Username* field when logging in to iMonitor (see [Figure 4-4](#)).

Figure 4-4 iMonitor Login Screen



The screenshot shows the 'iMonitor Login' screen. It has a blue header with the word 'Login'. Below it are two text input fields: 'Username:' (containing 'admin.novell\.') and 'Password:' (containing '*****'). At the bottom is a 'Login' button.

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4.6.7 Unattended Install and Configure to eDirectory 8.8 SP6 on Windows

eDirectory 8.8 SP6 automates the eDirectory installation and upgrade so that eDirectory is installed or upgraded silently on Windows servers without human intervention.

On Windows, the unattended installation of eDirectory uses predefined text files that facilitate the unattended installation/upgradation. You can perform either of the following setup using the unattended installation of eDirectory:

- ♦ Standalone installation or upgradation of eDirectory depending on whether it is a complete installation of eDirectory or not. Standalone upgradation upgrades only the installed files.
- ♦ Configuration of installed eDirectory. If you install eDirectory, a complete configuration of eDirectory is performed; else for an upgradation, configuration of only the upgraded files are performed.
- ♦ A combination of both installation/upgradation and configuration of eDirectory. It can either be installation and configuration of eDirectory or an upgradation and configuration of only the required files.

For more information on how to mention the setup for unattended installation, refer to the section [“Adding Features to the Automated Installation” on page 83](#).

Prerequisites

- ♦ Ensure Microsoft Visual C++ 2005 Runtime Libraries are installed. Install them manually from:

32-bit: vcredist_x86.exe, located at eDirectory\nt\i386\redist_pkg

64-bit: vc_redist_x86.exe and vc_redist_x64.exe located at eDirectory\nt\x64\redist_pkg

- ♦ Ensure NCI is installed:

32-bit: eDirectory/Windows/x64/nici/wcniciu0.exe

64-bit: eDirectory/Windows/x64/nici/wcniciu0.exe

- ♦ Set to program mode:

Run Windows/SysWOW64/novell/nici/set_server_mode.bat

The following sections discuss various features that can be used to configure the unattended installation, including the install location, no display of splash screens, port configurations, additional NMA methods, stopping and starting SNMP services, etc.

- ♦ [“Response Files” on page 82](#)
- ♦ [“Adding Features to the Automated Installation” on page 83](#)
- ♦ [“Controlling Automated Installation” on page 88](#)
- ♦ [“Unattended Installation of eDirectory using Response File” on page 91](#)

Response Files

Installing or upgrading to eDirectory 8.8 SP6 on Windows operating system can be made silent and more flexible by using a response file for the following:

- ♦ Complete unattended installation with all required user inputs
- ♦ Default configuration of components
- ♦ Bypassing all prompts during the installation

A response file is a text file containing sections and keys, similar to a `Windows.ini` file. You can create and edit a response file using any ASCII text editor. The eDirectory upgrade reads the installation parameters directly from the response file and replaces the default installation values with response file values. The installation program accepts the values from the response file and continues to install without prompts.

Response.ni File Sections and Keys

The eDirectory 8.8 SP6 installation requires changes to the sections in the response file to add information about the eDirectory instance to be installed, including the tree name, administrator context, administrator credentials (including user name and passwords), installation locations, etc. A full list of the keys and their default values is available in the sample `response.ni` file that is delivered with the eDirectory installation.

NOTE: You should use the provided `response.ni` file available at `eDirectory\nt\i386\NDSonNT\response.ni` (for 32-bit) and `eDirectory\windows\x64\NDSonNT\response.ni` (for 64-bit) in the eDirectory installation. There are essential parameters and set by default in this file. When editing the `response.ni` file, ensure there are no blank spaces between the key and the values along with the equals sign ("=") in each key-value pair.

Installation Syntax

You can also use a response file for two scenarios in an upgrade:

- ♦ To provide the values of the tree parameters and to configure an unattended installation
- ♦ To input values during an upgrade

IMPORTANT: You provide the administrator user credentials in the `response.ni` file for an unattended installation. Therefore, you should permanently delete the file after the installation to prevent the administrator credentials from being compromised.

Adding Features to the Automated Installation

Most details for configuring the eDirectory Installer have default setting for the manual installation. However, during unattended installation, each configuration parameter must be explicitly configured. This section discusses the basic settings to be configured, irrespective of any sequence of installation or additional features.

eDirectory Server Details

Regardless of whether it is an upgrade or a primary/secondary server installation, the details of the server being installed or upgraded must be provided to the Installer. Most of this information is configured in two tags, `[NWI:NDS]` and `[Initialization]`.

`[NWI:NDS]`

- ♦ **Upgrade Mode:** This key applies only to a server upgrade. Though not essential, set this parameter to `False` for fresh installations. For an upgrade, you can either set it to `True` or to `Copy`.

- ♦ **Server Context:** This is the complete DN of the server object (server name), along with the container object. For example, if the server being installed is 'EDIR-TEST-SERVER', the value for this parameter will be "EDIR-TEST-SERVER.Novell" if the Server container is 'Novell'.
- ♦ **mode:** The type of setup on eDirectory. The three types of setup are:
 - ♦ install: Performs installation of eDirectory or an upgradation of the required files.
 - ♦ configure: Configures eDirectory. If only an upgradation of the required files are done, then configuration of only those upgraded files are performed.
 - ♦ full: Performs both installation and configuration of eDirectory; it can be either installation and configuration of eDirectory or an upgradation and configuration of only the required files.

By default, the mode key is set to full.

NOTE: If you opt for the full setup mode, then while uninstalling eDirectory you cannot opt for individual deconfiguration and uninstallation option.

- ♦ **Tree Name:** For a primary server installation, this is the name of the tree that needs to be installed; for a secondary server installation, this is the tree to which this server must be added.
- ♦ **Server Name:** The name of the server that is being installed.
- ♦ **Server Container:** Any server added to a tree has a server object containing all the configuration details specific to the server. This parameter is the container object in the tree to which the server object will be added. For primary server installations, this container will be created with the server object.
- ♦ **Admin Login Name:** The name (RDN) of the Administrator object in the tree that has full rights, at least to the context to which this server is added. All operations in the tree will be performed as this user.
- ♦ **Admin Context:** Any user added to a tree has a user object that contains all the user-specific details. This parameter is the container object in the tree to which the Administrator object will be added. For primary server installations, this container will be created with the server object.
- ♦ **Admin password:** The password for the Administrator object created in the previous parameters. This password will be configured to the Administrator object during primary server installations. For secondary server installations, this needs to be the password of the Administrator object in the primary server that has rights to the context to which the new server is added.
- ♦ **NDS Location:** The eDirectory install location in the local system where the libraries and binaries are copied. By default, eDirectory is installed into C:\Novell\NDS unless it is changed in the response file.
- ♦ **DataDir:** Until eDirectory version 8.8, the DIB was installed inside the NDS location as a subfolder. Later, administrators were given the option to provide a different DIB location, because there might be too much data stored in the DIB to fit into the NDS location. Currently, by default the DIB is installed in the DIBFiles subfolder inside the NDS location, but administrators can change this parameter and provide a different location.

The following is a sample of text in the response file for all the basic parameters described above:

```
[NWI:NDS]
```

```
Upgrade Mode=copy
```

```
Tree Name=SLP-TEST
```

```
Server Name=NDS-LDAP-P2-NDS
Server Container=Novell
Server Context=NDS-LDAP-P2-NDS.Novell
Admin Context=Novell
Admin Login Name=Admin
Admin Password=novell
NDS Location=E:\Novell\NDS
DataDir=E:\Novell\NDS\DIBFiles
```

You can also configure two additional parameters:

- ♦ **Installation Location:** This is the same as the NDS Location configured in the previous section. This location is used by the Installer while copying files to the install location, and the other location is used by the components to refer to the base eDirectory installation while they are configured. The default value is C:\Novell\NDS, if not specified in the response file.

For example:

```
[Novell:DST:1.0.0_Location]
```

```
Path=file:/C:\Novell\NDS
```

- ♦ **System Location:** The eDirectory Installer requires access to the system folder to copy DLLs and to access system-specific files during installation. This parameter must be configured with the path to the system folder of the machine where the server is installed.

For example:

```
[Novell:SYS32_DST:1.0.0_Location]
```

```
Path=file:/C:\WINNT\system32
```

The following screen appears when the server collects the above parameters from the response file.

Figure 4-5 *Installing eDirectory*



Adding NMAS Methods

eDirectory supports installation of multiple NMAS methods, both during install and upgrade. During manual installations, you can select the NMAS methods to install and configure. This can also be achieved in automated installations.

The NMAS-related configuration settings are provided inside the [NWI:NMAS] tag. The tag has two keys to be configured, and both are mandatory:

- ♦ **Choices:** This key informs the eDirectory installation component on the number of NMAS methods that need to be installed.

- ♦ **Methods:** This key lists the NMAS method options that need to be installed. Currently, there are 12 supported NMAS methods. The method names and their types are as follows:

Table 4-1 NMAS Methods

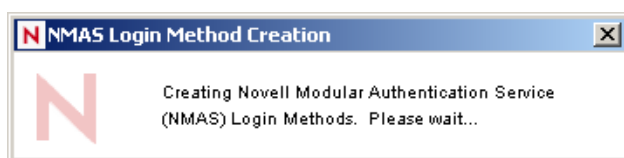
Method Name	Method Type
CertMutual	Certificate mutual login method
Challenge Response	The Novell challenge response NMAS method
DIGEST-MD5	Digest MD5 login method
GSSAPI	SASL GSSAPI mechanism for eDirectory. Authentication to eDirectory through LDAP using a Kerberos ticker
NDS	NDS login method (default)
Simple Password	Simple password NMAS login method

NOTE: The method names should exactly match those listed in the above table, as options to the Methods key. The Installer matches the exact string (with case) for choosing the NMAS methods to install.

The NDS NMAS method is mandatory and will be installed automatically if no NMAS methods list is provided. However, if you are creating an explicit list, do not remove this method from the list.

If the NMAS methods are configured using this methodology in the response file, eDirectory shows the following status while installing, without prompting for user input.

Figure 4-6 NMAS Login Method Creation



The following is sample text in the response file for choosing the NMAS methods:

```
[NWI:NMAS]
```

```
Choices=12
```

```
Methods=X509 Advanced Certificate,CertMutual,Challenge Response,DIGEST-  
MD5,Enhanced Password,Entrust,GSSAPI,NDS,NDS Change Password,Simple  
Password,Universal Smart Card,X509 Certificate
```

HTTP Ports

eDirectory listens on preconfigured HTTP ports for access through the Web. For example, iMonitor accesses eDirectory through Web interfaces. They need to specify certain in order to access the appropriate applications. There are two keys that can be set prior to installation to configure eDirectory on specific ports:

- ♦ **Clear Text HTTP Port:** The port number for the HTTP operations in clear text.

- ♦ **SSL HTTP Port:** HTTP port number for operations on the secure socket layer.

The following is sample text in the response file for configuring HTTP port numbers:

```
[eDir:HTTP]
Clear Text HTTP Port=8028
SSL HTTP Port=8030
```

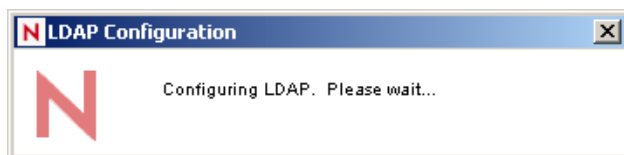
LDAP Configuration

eDirectory supports LDAP operations. It listens for LDAP requests in clear text and SSL, on two different ports. These ports can be configured in the response file prior to installation so that when eDirectory is started, it listens on these configured ports.

There are three keys in the [NWI:NDS] tag that configure the LDAP ports:

- ♦ **LDAP TLS Port:** The port on which eDirectory should listen for LDAP requests in clear text.
- ♦ **LDAP SSL Port:** The port on which eDirectory should listen for LDAP requests in SSL. You can also use a key to configure whether eDirectory should mandate secure connections when bind requests send the password in clear text.
- ♦ **Require TLS:** Whether eDirectory should mandate TLS when receiving LDAP requests in clear text.

Figure 4-7 LDAP Configuration



The following is sample text in the response file for LDAP configuration:

```
[NWI:NDS]
Require TLS=No
LDAP TLS Port=389
LDAP SSL Port=636
```

Language Settings

The eDirectory Installer language settings configure the locale and set the display language.

There are currently three locale options that can be set during installation: English, French and Japanese. Each has a specific key in the [Novell:Languages:1.0.0] tag that can be set to True/False prior to the start of installation.

- ♦ **LangID4:** English. Setting this to True configures the English locale during installation.
- ♦ **LangID6:** French. Setting this to True configures the French locale during installation.
- ♦ **LangID9:** Japanese. Setting this to True configures the Japanese locale during installation.

These options are mutually exclusive, which is easily enforced in manual installation via radio buttons. In unattended installations, you need to ensure only one of them is set to True.

The following is sample text in the response file for configuring an English locale:

```
[Novell:Languages:1.0.0]
```

```
LangID4=true
```

```
LangID6=false
```

```
LangID9=false
```

Status messages about the configuration of each component are displayed in message boxes throughout the installation. By default, these messages are in English. You can also change the display language during installation by using the DisplayLanguage key in the [Initialization] tag.

- ♦ **DisplayLanguage:** This key is in the [Initialization] section. Its parameters configure languages.

The following is sample text in the response file for configuring English as the display language:

```
[Initialization]
```

```
DisplayLanguage=en_US
```

Configuration Mode Settings

If the setup mentioned in the mode key is configure, then ensure that you do not change the RestrictNodeRemove value of the ConfigurationMode key in the [Initialization] section.

Controlling Automated Installation

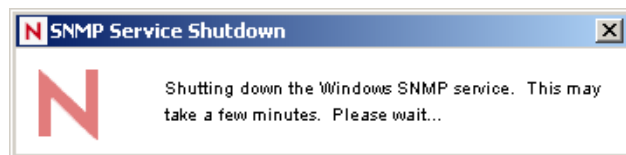
The response file can also be edited to control the flow of automated installation.

Stopping SNMP services

This feature is specific to an eDirectory installation on Windows. Most Windows servers have SNMP configured and running. When eDirectory installs, the SNMP services need to be brought down and restarted after the installation. With manual installations, the Installer prompts the user on-screen to stop the SNMP services before continuing the installation. This prompt can be avoided during automation by setting the key in the [NWI:SNMP] tag:

- ♦ **Stop service:** Set the value to Yes to stop the SNMP services without prompting. The status of is displayed on-screen as shown below:

Figure 4-8 SNMP Service Shutdown



The following is sample text in the response file for stopping SNMP services:

```
[NWI:SNMP]
```

```
Stop service=yes
```


SLP Services

eDirectory uses SLP services to identify other servers or trees in the subnet during installation or upgrade. If SLP services are already installed on your server, and you want to replace them with the version that ships with the current version of the eDirectory (or use your own SLP services), you can set appropriate keys in the [NWI:SLP] tag to uninstall and remove the existing SLP services.

The following is sample text in the response file for uninstalling and removing SLP services:

```
[EDIR:SLP]

Need to uninstall service=true

Need to remove files=true
```

Primary/Secondary Server Installation

eDirectory Installer provides options for the unattended install of a primary or a secondary server, into a network. There are three keys that help the Installer decide whether it is a primary or a secondary server installation.

- ♦ **New Tree:** Use this key in the [NWI:NDS] tag and set it to Yes for a new tree installation, or No for a secondary server installation.
- ♦ **ExistingTreeYes:** This key is in the [Novell:ExistingTree:1.0.0] tag. Set it to True/false. Set this to False for a new tree or primary server installation and set it to True for a secondary server in an existing tree.
- ♦ **ExistingTreeNo:** This key also is in the [Novell:ExistingTree:1.0.0] tag. Although it seems to be redundant to the previous key, the Installer refers to both keys, so both of them must be configured properly. Set this one to True for a new tree or primary server installation and set it to False for adding a secondary server in an existing tree.

For example, the keys for installing a primary server in a new tree would be as follows:

```
[NWI:NDS]

New Tree=Yes


[Novell:ExistingTree:1.0.0]

ExistingTreeYes=false

ExistingTreeNo=true
```

and for a secondary server installation into an existing tree:

```
[NWI:NDS]

New Tree=No


[Novell:ExistingTree:1.0.0] ExistingTreeYes=true ExistingTreeNo=false
```

Preconfigured Unattended Installation

All user-specific configuration details can be edited in the response file. However, there are certain parameters that should not be changed. These are for file copy and component information specific to the eDirectory components to be installed. Make sure these parameters in the response file are not modified. Do not change them from the values in the eDirectory release.

Install as Service Tag: eDirectory runs as a service in Windows. It is mandatory that this parameter is always set to Yes to make sure that eDirectory is installed as a service.

```
[NWI:NDS]
```

```
Install as Service=Yes
```

Selected Nodes Tag: This tag lists the components that are installed in eDirectory, along with information in the profile database that contains more information about the component, including source location, destination copy location, and component version. These details in the profile database are compiled into a .db file that is delivered in the eDirectory release.

```
[Novell:NOVELL_ROOT:1.0.0]
```

File Copy Tag: This tag contains keys for display settings that are handled in the next section, including the file copy profile information:

```
overWriteNewerFile=false
```

```
overWriteNewerFilePrompt=true
```

```
copyToRemoteDestination=true
```

These options specify the response from the eDirectory Installer in scenarios such as file write conflicts, file copying decisions, etc.

Silent Installation Parameters

This section describes parameters that need to be set for the Installer to run unattended.

```
[NWI:NDS]
```

```
Prompt=false
```

The [NWI:NDS] section describes eDirectory configuration details such as tree name and server name. If you don't want the Installer to prompt for values for these parameters, set this parameter to False.

```
[Selected Nodes]
```

```
Prompt=false
```

If you don't want the Installer to prompt for the destination copy location, version details, etc. for all components configured with the eDirectory, set this parameter to False in the [Selected Nodes] tag.

```
[Novell:NOVELL_ROOT:1.0.0]
```

```
Prompt=false
```

If you don't want the Installer to prompt for yes/no questions, or for other decisions with parameters in this section, set this parameter to False in the [Selected Nodes] tag.

```
[Novell:ExistingTree:1.0.0]
```

```
Prompt=false
```

If you don't want the Installer to prompt for deciding whether is it a new tree installation, or for adding a secondary server to an existing tree, set this parameter False in the [Selected Nodes] tag.

```
[Initialization]
```

```
InstallationMode=silent
```

```
SummaryPrompt=false
```

```
prompt=false
```

The `InstallationMode` key must always be explicitly set to `Silent` for unattended installations.

Status and Image Displays

During installation, there are various images and status information displayed. Most images contain information on what version of eDirectory is installed, what components are installed, a welcome screen, license files, customization options, a status message indicating the component currently being installed, percentage complete, etc. Some applications that intend to embed eDirectory might not want eDirectory displaying these images.

All image and status display details are configured in the `[Novell:NOVELL_ROOT:1.0.0]` tag, including configuration information for the welcome page, close page, summary page, license agreement page, language page, custom choices page, wizard page, welcome page. There are corresponding on/off parameters for each of these configurations.

For example:

- ♦ The `welcomeScreen` parameter is controlled by `showWelcomeScreen=true/false`
- ♦ The `summaryScreen` parameter is controlled by `allowSummary=true/false`
- ♦ The `licenseAgreementScreen` parameter is controlled by `allowLicenseAgreement=true`
- ♦ If the progress bar shouldn't be displayed, use `allowStatusBar=false`
- ♦ If the final page that reports successful installation is not required, set `[eDirCloseScreen]Silent=true`

Most of the details are preconfigured in the response file that ships with eDirectory. If you need modifications, change the parameters in this tag.

Unattended Installation of eDirectory using Response File

Launching the eDirectory Installer on Windows is easy. The `install.exe` delivered in the eDirectory release is invoked in the command line with a few additional parameters.

Depending on the setup mode you have mentioned, use either of the following commands:

NOTE: The `nopleasewait` option used in the commands ensures that the status window of install/upgrade/configure is not displayed.

Install

32-bit: <Unzipped Location>\nt\I386\NDSonNT>install.exe /silent /nopleasewait /template=<Response file>

For example, D:\builds\88SP6_i386\nt\I386\NDSonNT>install.exe /silent /nopleasewait /template=D:\builds\88SP6_i386\nt\I386\NDSonNT\response.ni

64-bit: <Unzipped Location>\windows\x64\NDSonNT>install.exe /silent /nopleasewait /template=<Response file>

For example, D:\builds\88SP6_i386\windows\x64\NDSonNT>install.exe /silent /nopleasewait /template=D:\builds\88SP6_i386\nt\I386\NDSonNT\response.ni

Configure

32-bit and 64-bit: <Windows Drive>\Program Files\Common Files\novell>install.exe /silent /restrictnoderemove /nopleasewait /template=<Response file>

For example, c:\Program Files\Common Files\novell>install.exe /silent /restrictnoderemove /nopleasewait /template=D:\builds\88SP6_i386\nt\I386\NDSonNT\response.ni

A combination of installation/upgradation and configuration of eDirectory

32-bit: <Unzipped Location>\nt\I386\NDSonNT>install.exe /silent /nopleasewait /template=<Response file>

For example, D:\builds\88SP6_i386\nt\I386\NDSonNT>install.exe /silent /nopleasewait /template=D:\builds\88SP6_i386\nt\I386\NDSonNT\response.ni

64-bit: <Unzipped Location>\windows\x64\NDSonNT>install.exe /silent /nopleasewait /template=<Response file>

For example, D:\builds\88SP6_i386\windows\x64\NDSonNT>install.exe /silent /nopleasewait /template=D:\builds\88SP6_i386\nt\I386\NDSonNT\response.ni

Relocating the DIB

5

After installing and configuring Novell eDirectory, if there is a need to relocate the DIB, you can do it. You might want to relocate your DIB for multiple reasons, such as, if the number of objects in the tree is expected to grow but the current file system where the DIB exists does not have sufficient space.

5.1 Linux and UNIX

Complete the following procedure to relocate your DIB:

- 1 Check the server status as follows:

```
ndscheck
```

- 2 Stop the eDirectory service using ndsmanage as follows:

- 2a Enter ndsmanage at the command prompt.

- 2b Select the instance you want to stop.

The menu expands to include the options you can perform on a specific instance.

- 2c Enter k to stop the instance.

- 3 Get the current DIB location using the following command:

```
ndsconfig get n4u.nds.dibdir
```

NOTE: In eDirectory 8.8, by default the DIB is located at `/var/opt/novell/eDirectory/data/dib` and on pre-eDirectory 8.8 servers, it is located at `/var/nds/dib`.

- 4 Copy the DIB to the new location as follows:

```
cp -rp current_DIB_location new_DIB_location
```

For example: To copy the DIB to `/home/nds/dib`, enter the following:

```
cp -rp /var/opt/novell/eDirectory/data/dib/* /home/nds/dib/
```

- 5 Edit the instance-specific `nds.conf` configuration file and change the parameter value of `n4u.nds.dibdir` as follows:

```
n4u.nds.dibdir=new_DIB_location
```

For example, if you are changing the DIB from `/var/nds/dib` to `/home/nds/dib`, type the following:

```
n4u.nds.dibdir=/home/nds/dib
```

- 6 Start the eDirectory service as follows

- 6a Enter ndsmanage at the command prompt.

- 6b Select the instance you want to start.

The menu expands to include the options you can perform on a specific instance.

- 6c Enter s to start the instance.

- 7 Check the server status as follows:

```
ndscheck
```

5.2 Windows

DIB relocation is currently not supported. However, you can locate the DIB in a custom location during the eDirectory installation.

Upgrade Requirements of eDirectory 8.8

6

One of the unique features of eDirectory is its ability to maintain the tight referential integrity. Any object Classes derived from Top will have a reference attribute in its class definition. This is a hidden attribute added to all the referenced objects that are internally maintained by eDirectory. Background processes keep running to check the links between the referenced object and the referencing objects.

If the referenced object is from a different partition than the one held locally in the server, an external reference to that object will be created locally in the external reference partition. An external reference is a representation of an object existing in the eDirectory tree; however, it is not a copy of the object and its assigned attributes.

Though we can remove the Reference attribute from eDirectory, currently, the class definitions are untouched to maintain the backward compatibility in the tree.

Figure 6-1 iMonitor Output showing References to an Object

Resource Agent Dependency

.T=JCJ-REF-TREE.

Server Dependency



.CN=jjaimon.OU=servers.O=novell.T=JCJ-REF-TREE.

Local Object Dependency

.CN=Developers.OU=edir.O=novell.JCJ-REF-TREE.

Used By

TimeStamp	Flags	Name Space	Volume	Path
05/01/06 09:08:34 PM 1:1	Present	0	.JCJ-REF-TREE.	

Reference

00008059 .CN=Developers.OU=edir.O=novell.JCJ-REF-TREE.

This chapter explains the changes and possible upgrade scenarios in eDirectory 8.8.

- ♦ [Section 6.1, “Reference Changes in 8.8 SP1 or later versions,” on page 96](#)
- ♦ [Section 6.2, “Upgrade Process in 8.8 SP6,” on page 96](#)
- ♦ [Section 6.3, “Performing a Dry Run before Upgrading eDirectory,” on page 98](#)

6.1 Reference Changes in 8.8 SP1 or later versions

The reference attribute is a hidden attribute and is maintained on each referenced object. This is created and maintained by DS. The new referencing code in DS is based on a FLAIM index called `LocalEntryIDIndex` that DS creates. Though FLAIM maintains the index, the usage is determined by DS. FLAIM automatically updates the index when a DN value is added or deleted. Each key in the index is a compound key, i.e, DN of the object being referenced + Entry ID of the referencing object. For example, if there is an object with Entry ID 343, and it has a “member” value that points to object #899, FLAIM will automatically generate a key in the index of 899+343.

DS can now do lookups in the index to find all the objects pointing to object #899. Object #899 does not have to keep a reference attribute on itself to remember all the objects referencing it. Actually, FLAIM maintains the index without knowing how it is used, but DS has the code that knows how to use the index.

However, the new way of maintaining references requires a database upgrade when the existing eDirectory instance is upgraded to 8.8 SP1 or later versions. The upgrade requires the creation of a new index; which will require traversing each entry in the database. It also requires the removal of all of the “reference” attributes from each entry in the database. In addition, some internal octet string attributes used by DS that had embedded DNs would need to generate some new DN values to store alongside the octet string value. All this would be a time consuming process on a large database. Since DS is changed to do referential integrity using new FLAIM feature, and that depends on the new index, there is no way DS can really operate until the conversion is complete - so the first time an existing database is opened, all reference attributes need to be changed to a new index. It could take hours before it actually opens and is ready for use by applications for a large database.

6.2 Upgrade Process in 8.8 SP6

`ndsconfig` upgrade is used to upgrade the necessary configuration of the individual components such as HTTP, LDAP, SNMP, SAS, and NMAS. eDirectory database is upgraded to a new format if eDirectory versions prior to eDirectory 8.8 SP1 are upgraded to eDirectory 8.8 SP6.

The appropriate upgrade utility is called after the packages are upgraded to eDirectory 8.8 SP5. Refer to the eDirectory install and upgrade documents in [Novell eDirectory 8.8 Installation Guide](http://www.novell.com/documentation/edir88/index.html) (<http://www.novell.com/documentation/edir88/index.html>)

A new offline database upgrade utility is available with eDirectory 8.8 SP1 onwards.

NOTE: In case the administrator wants to run the utility and find out the status of the upgrade, this database upgrade tool can be used with a copy of the database or with `-d` option

Unix/Linux	Windows
<code>ndsdbupg</code>	<code>ndsdbupg.exe</code>

Figure 6-2 ndsdibupg Help Screen

```

SuSE:/opt/novell/eDirectory/bin #
SuSE:/opt/novell/eDirectory/bin # ./nsdibupg --help
./nsdibupg - DIB Upgrade Utility for Novell eDirectory 8.8 SP1 v20114.24
Usage: ./nsdibupg [-qdv] [-l logfile] <dibdirectory>
Options:
  -q          Quite. Do not bring up the text UI
  -d          Dry run. Will not commit the upgraded dib
  -v[0-3]     Verbosity in log message. This will be valid only if -l option
is given
              0      Only query messages will be logged.
              1      Only transaction messages will be logged
              2      Only general messages will be logged
              3      All messages will be logged ( default )
  -l<logfile> Log file name where messages will be logged.
SuSE:/opt/novell/eDirectory/bin #

```

The following table discusses the ndsdibupg options.

Table 6-1 ndsdibupg Options

Option	Description
-q	Quiet mode. There will not be any messages in quiet mode. Messages will be logged to log file (if provided) even in -q mode. It is recommended that you always provide a log file name for troubleshooting purpose.
-d	Dry run. Upgrade will be performed on a copy of the actual database.
	<p>IMPORTANT: ds.nlm should be unloaded before loading dsdibup.nlm.</p> <p>This option can be used if the administrator wants to know if the upgrade is going to be successful and also to estimate the time required to upgrade the database. It is recommended to take a copy of the DIB.</p> <p>NOTE: eDirectory service should be unloaded or stopped before taking a copy of the database. ndsdibupg utility can be run on the copied database to estimate the downtime required for the actual upgrade. During this time, eDirectory service can be loaded or restarted.</p>
-v	Verbosity of the messages. The default value is 3 where all messages are logged. It is recommended to always leave the verbosity level to its default value.

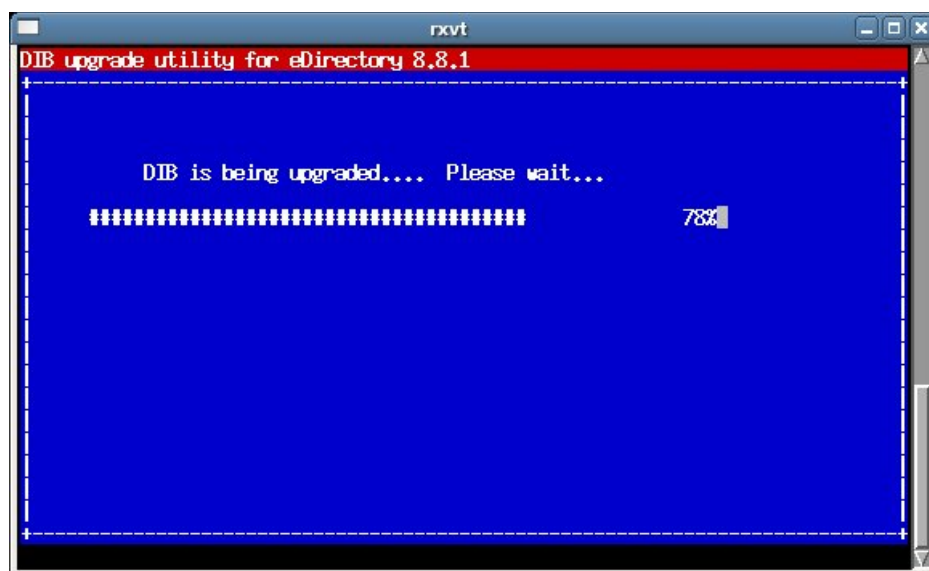
Option	Description
-l	<p>Provide a log file name where messages are logged during upgrade. The log file will indicate the time the upgrade started and the end time. Given below is a snapshot of log file.</p> <pre> ##### Utility called with DIB directory: /var/opt/novell/eDirectory/data/dib ##### options Log File: /var/opt/novell/eDirectory/log/ndsdbupg.log Starting the DIB upgrade: Nov 25 19:52:32 Opening the DIB to start upgrade process... Total DIB size: 158 MB QUERY CRITERIA: FLD:30 == 4278190110 AND FLD:33.34 == "Reference" {OptInfo: UsingIX=143, KeyMatch=YES, RecMatch=NO, FromKeyLen=16, FromKey={1F FF 00:2 1E 02 99 87 88 87 99 87 93 83 87 05}, UntilKeyLen=16, UntilExcl=Yes, UntilKey={1F FF 00:2 1E 02 99 87 88 87 99 87 93 83 87 07}} {Stats: Container=32001, Matched=1, KeysFailed=0 of 1, RefsFailed=0 of 1} QUERY CRITERIA: (<empty>) {OptInfo: Full Container Scan} {Stats: Container=2, Matched=570, RecsFetched=570, RecsRejected=0, RecsNotFound=0} # 2 . . . ##### 100 Indexing progress: Index 220 is offline. Last record processed = 84088. DIB upgrade process completed (Nov 25 19:53:05). Status: success(0) </pre>

6.3 Performing a Dry Run before Upgrading eDirectory

ndsdbupg can be used to perform a dry run before upgrading the packages. This utility alone can be used against a copied database on all the supported platforms. The advantage is that eDirectory services will still be available when the dry run is being performed.

Here, -d option can be used where the upgrade utility itself takes a copy of the DIB and performs the upgrade on the copy. ds.nlm should be unloaded while copying the database to ensure the integrity of the database. Upgrade will require twice the size of the database since a copy needs to be taken.

Figure 6-3 Upgrade Process



6.3.1 Common Problems Encountered during the Upgrade Process

The following FAQ section discusses the common problems faced while upgrading from the previous versions of eDirectory to eDirectory 8.8.

Question: I am upgrading from eDirectory 8.7.x to eDirectory 8.8. The upgrade process failed with an error. My eDirectory 8.7.x server no longer comes up.

Answer: While upgrading from 8.7.x to eDirectory 8.8, the database goes through a two phase upgrade. In the first phase, a key pair is created for encrypted attributes support which was introduced in eDirectory 8.8. In the second phase, DIB upgrade happens for reference changes. In case the second phase fails after the first phase, the existing binaries (eDirectory 8.7.x) will not be able to open the database as database is already upgraded to 8.8 level and the database version is changed to reflect that. We recommend taking a backup of the database before proceeding with upgrading to eDirectory 8.8. Please refer to [Section 8.2, “Migrating to eDirectory 8.8 SP6 Without Upgrading the Operating System,”](#) on page 110 for further details.

Question: The upgrade process seems to be taking a lot of time.

Answer: The upgrade scans the entire database and checks for reference attributes on all the objects. This process might take a while depending on the number of the objects in the database. It may take hours for a database with 5 million objects with reference attributes on all the objects.

Question: The upgrade process seems to be taking a lot of space in the storage.

Answer: Since the entire reference upgrade has to be done in a single transaction and transaction rollback is required in case the upgrade fails, flaim keeps the changed blocks in its nds.db file. As a result of this, you might observe the nds.db growing during the upgrade process. This is quite normal. The file might spill over to nds.00v, nds.002, etc. The upgrade process will require as much

as 100% of existing disk space depending on the number of objects to be upgraded. For e.g., a DIB size of 15Gig might require another 15Gig free space, if all objects in the DIB has reference attributes.

Question: The eDirectory database upgrade proceeds even if I provide a wrong password and admin user.

Answer: eDirectory package upgrade and database upgrade happens based on your file system rights. The eDirectory administrator password will not be used for this. It has a side effect that the login might fail once the upgrade begins. The next attempt of “ndsconfig upgrade” will always go through.

Question: I provided a wrong password for administrator. My upgrade failed, and I started the upgrade again with the correct password. The upgrade is again taking long time (as long as 1 hour for a 5 million objects with reference attributes on all) to bring up the initial display.

Answer: eDirectory maintains the reference attributes in a separate container in the database. The delay in the initial display is due to the time it takes FLAIM to delete the database container that holds the “Reference” attribute records.

Configuring Novell eDirectory on Linux, Solaris, or AIX Systems

7

Novell eDirectory includes configuration utilities that simplify the configuration of various eDirectory components on Linux, Solaris, and AIX systems. The following sections provide information about functionality and usage of eDirectory configuration components:

- ♦ [Section 7.1, “Configuration Utilities,” on page 101](#)
- ♦ [Section 7.2, “Configuration Parameters,” on page 102](#)
- ♦ [Section 7.3, “Security Considerations,” on page 107](#)

7.1 Configuration Utilities

This section provides information about using the following eDirectory configuration utilities:

- ♦ [Section 7.1.1, “The ndsconfig Utility,” on page 101](#)
- ♦ [Section 7.1.2, “Using the ldapconfig Utility to Configure the LDAP Server and LDAP Group Objects,” on page 101](#)
- ♦ [Section 7.1.3, “Using the nmasinst Utility to Configure Novell Modular Authentication Service,” on page 102](#)
- ♦ [Section 7.1.4, “Using ndsd init Script,” on page 102](#)

7.1.1 The ndsconfig Utility

You can use the ndsconfig utility to configure eDirectory. This utility can also be used to add the eDirectory Replica Server into an existing tree or to create a new tree. For more information, see [Section 1.6.4, “Using the ndsconfig Utility to Add or Remove the eDirectory Replica Server,” on page 26](#).

NOTE: Ensure that the NCP™ server name is unique in the network.

To change the current configuration of the installed components, use the following syntax:

```
ndsconfig {set value_list | get [parameter_list] | get help [parameter_list]}
```

Refer to [Section 7.2, “Configuration Parameters,” on page 102](#) for a description of ndsconfig parameters.

7.1.2 Using the ldapconfig Utility to Configure the LDAP Server and LDAP Group Objects

You can use the LDAP configuration utility, ldapconfig, on Linux, Solaris, and AIX systems to modify, view, and refresh the attributes of LDAP Server and Group objects.

For more information, see [Using the ldapUtility on Linux and UNIX \(http://www.novell.com/documentation/edir88/edir88/data/h0000007.html\)](http://www.novell.com/documentation/edir88/edir88/data/h0000007.html) in the *Novell eDirectory 8.8 Administration Guide*.

7.1.3 Using the nmasinst Utility to Configure Novell Modular Authentication Service

For eDirectory 8.8, by default, ndsconfig configures NMAS. You can also use nmasinst on Linux, Solaris, and AIX systems to configure NMAS.

ndsconfig only configures NMAS and does not install the login methods. To install these login methods, you can use nmasinst. For more information, see [“Using the nmasinst Utility to Configure NMAS” on page 37](#).

7.1.4 Using ndsd init Script

The ndsd init script starts the daemon when the system boots up, with the configuration parameters from the default configuration file, `/etc/opt/novell/eDirectory/conf/nds.conf`.

Before invoking ndsd, ensure that any SLP (Service Location Protocol) agent is running on the host. You can install OpenSLP, any native SLP available with your operating system, or Novell SLP.

To start ndsd, enter the following:

For Linux and Solaris: `/etc/init.d/nds start`

For HP-UX: `/sbin/init.d/nds start`

To stop ndsd, enter the following:

For Linux and Solaris: `/etc/init.d/nds stop`

For HP-UX: `/sbin/init.d/nds stop`

The following shell scripts are created in `/opt/novell/eDirectory/sbin`:

- ♦ `pre_ndsd_start`
- ♦ `post_ndsd_start`
- ♦ `pre_ndsd_stop`
- ♦ `post_ndsd_stop`

As the name indicates, the `pre_ndsd_start` script is executed before ndsd binary is started by the `/etc/init.d/nds` script. The `post_ndsd_start` script is executed after ndsd binary is started by the `/etc/init.d/nds` script. Similarly, the `pre_ndsd_stop` and `post_ndsd_stop` scripts are executed before and after killing ndsd process, respectively.

Users can add commands of their choice to these scripts to get them executed. By default, the `post_ndsd_start` script has commands to ensure that `/etc/init.d/nds` comes out after ensuring that the LDAP services are up and running.

7.2 Configuration Parameters

The eDirectory configuration parameters are stored in the `nds.conf` file.

When configuration parameters are changed, ndsd needs to be restarted for the new value to take effect. You should use ndsmanage to restart ndsd.

However, for some configuration parameters, ndsd need not be restarted. These parameters are listed below:

- ♦ n4u.nds.inactivity-synchronization-interval
- ♦ n4u.nds.synchronization-restrictions
- ♦ n4u.nds.janitor-interval
- ♦ n4u.nds.backlink-interval
- ♦ n4u.nds.drl-interval
- ♦ n4u.nds.flatcleaning-interval
- ♦ n4u.nds.server-state-up-thresholdn4u.nds.heartbeat-scheman4u.nds.heartbeat-data

The following table provides a description of all the configuration parameters.

Parameter	Description
n4u.nds.preferred-server	The host name of the machine that hosts the eDirectory service. Default=null
n4u.base.tree-name	The tree name that Account Management uses. This is a mandatory parameter set by the Account Management Installer. This parameter cannot be set .
n4u.base.dclient.use-udp	DClient can use UDP in addition to TCP for communicating with the eDirectory servers. This parameter enables the UDP transport feature. Default=0 Range=0, 1
n4u.base.slp.max-wait	The Service Location Protocol (SLP) API calls timeout. Default=30 Range=3 to 100 This value is in seconds. This option is supported only by Novell SLP and not OpenSLP.
n4u.nds.advertise-life-time	eDirectory reregisters itself with the Directory Agent after this time period. Default=3600 Range=1 to 65535 This value is in seconds.
n4u.server.signature-level	Determines the level of enhanced security support. Increasing this value increases security, but decreases performance. Default=1 Range=0 to3

Parameter	Description
n4u.nds.dibdir	<p>The eDirectory directory information database.</p> <p>Default:</p> <p><code>/var/opt/novell/eDirectory/data/dib</code></p> <p>This parameter cannot be set using the <code>ndsconfig</code> set command. You can manually change this parameter if you want to relocate your DIB. However, you are not recommended to do so.</p>
n4u.nds.server-guid	<p>A globally unique identifier for the eDirectory server.</p> <p>Default=null</p>
n4u.nds.server-name	<p>The name of the eDirectory Server.</p> <p>Default=null</p>
n4u.nds.bindery-context	<p>The Bindery context string.</p> <p>Default=null</p>
n4u.nds.server-context	<p>The context that the eDirectory server is added to. This parameter cannot be set or changed.</p>
n4u.nds.external-reference-life-span	<p>The number of hours unused external references are allowed to exist before being removed.</p> <p>Default=192</p> <p>Range=1 to 384</p>
n4u.nds.inactivity-synchronization-interval	<p>The interval (in minutes) after which full synchronization of the replicas is performed, following a period of no change to the information held in the eDirectory on the server.</p> <p>Default=60</p> <p>Range=2 to 1440</p>
n4u.nds.synchronization-restrictions	<p>The Off value allows synchronization with any version of the eDirectory. The On value restricts synchronization to version numbers you specify as parameters (for example, ON,420,421).</p> <p>Default=Off</p>
n4u.nds.janitor-interval	<p>The interval (in minutes) after which the eDirectory Janitor process is executed.</p> <p>Default=2</p> <p>Range=1 to 10080</p>
n4u.nds.backlink-interval	<p>The interval (in minutes) after which the eDirectory backlink consistency is checked.</p> <p>Default=780</p> <p>Range=2 to 10080</p>

Parameter	Description
n4u.nds.drl-interval	<p>The interval (in minutes) after which the eDirectory distributed reference link consistency is checked.</p> <p>Default=780 Range=2 to 10080</p>
n4u.nds.flatcleaning-interval	<p>The interval (in minutes) after which the flatcleaner process automatically begins purging and deleting entries from the database.</p> <p>Default=720 Range=1 to 720</p>
n4u.nds.server-state-up-threshold	<p>The server state up threshold, in minutes. This is the time after which the eDirectory checks the server state before returning -625 errors.</p> <p>Default=30 Range=1 to 720</p>
n4u.nds.heartbeat-schema	<p>The heartbeat base schema synchronization interval in minutes.</p> <p>Default=240 Range=2 to 1440</p>
n4u.nds.heartbeat-data	<p>The heartbeat synchronization interval in minutes.</p> <p>Default=60 Range=2 to 1440</p>
n4u.nds.dofsync	<p>Setting this parameter to 0 increases update performance significantly for large databases, but there is a risk of database corruption if the system crashes.</p>
n4u.server.configdir	<p>The eDirectory configuration files are placed here.</p> <p>Default=/etc</p>
n4u.server.vardir	<p>The eDirectory and utilities log files are placed here.</p> <p>Default=/var/opt/novell/eDirectory/log</p>
n4u.server.libdir	<p>The eDirectory specific libraries are placed here in the nds-modules directory.</p> <p>Default=/opt/novell/eDirectory/lib</p>
n4u.server.sid-caching	<p>Enables SSL session ID caching. Refer to the SSL v3.0 RFC for more details about session ID caching in SSL.</p>
n4u.server.tcp-port	<p>The default port used if the port number is not specified in the n4u.server.interfaces parameter.</p>

Parameter	Description
n4u.server.interfaces	<p>The IP address and port number that eDirectory server should listen on for client connections. The value can be a comma-separated list specifying more than one combination of possible settings.</p> <p>For example: n4u.server.interfaces=101.1.2.3@524,100.1.2.3@1524</p>
n4u.server.max-interfaces	<p>This parameter specifies maximum number of interfaces that eDirectory will use.</p> <p>Default =128.</p> <p>Range =1 to 2048.</p>
n4u.server.max-openfiles	<p>This parameter specifies the maximum number of file descriptors that eDirectory can use.</p> <p>Default=maximum allowed by the administrator</p>
n4u.server.max-threads	<p>The maximum number of threads that will be started by the eDirectory server. This is the number of concurrent operations that can be done within the eDirectory server.</p> <p>Default=64 Range=32 to 512</p> <p>Refer to the eDirectory tuning guide to set an optimum value.</p>
n4u.server.idle-threads	<p>The maximum number of idle threads that are allowed in the eDirectory server.</p> <p>Default=8 Range=1 to 128</p>
n4u.server.start-threads	<p>Initial number of threads to be started up.</p> <p>Default=8</p>
n4u.server.log-levels	<p>This parameter helps to configure the error logging settings for the server-side messages. It sets the message log level to LogFatal, LogWarn, LogErr, LogInfo, or LogDbg.</p>
n4u.server.log-file	<p>This parameter specifies the log file location where the messages would be logged. By default, the messages are logged into the <code>nds.d.log</code> file.</p>
n4u.ldap.lburp.transize	<p>Number of records that are sent from the Novell Import/Export client to the LDAP server in a single LBURP packet. You can increase the transaction size to ensure that multiple add operations can be performed in a single request.</p> <p>Default=25 Range=1 to 250</p>

Parameter	Description
n4u.server.listen-on-loopback	It is a boolean parameter, and enabled by default. In a few recent Linux distributions, the hostname in /etc/hosts file is associated with the loopback address. Though the common address given in the SLES systems is 127.0.0.2, it can be anything from 127.0.0.0 to 127.255.255.255 (valid loopback addresses).
http.server.interfaces	Comma-separated list of interfaces that HTTP server should use.
http.server.request-io-buffer-size	Default IO buffer size.
http.server.request_timeout-seconds	Server request timeout.
http.server.keep-timeout-seconds	Number of seconds to wait for the next request from the same client on the same connection.
http.server.threads-per-processor	HTTP thread pool size per processor.
http.server.session-exp-seconds	Session expiration time in seconds.
http.server.sadmin-passwd	Session administrator password.
http.server.module-base	HTTP server webroot.
https.server.cached-cert-dn	HTTPS server cached certificate DN.
https.server.cached-server-dn	HTTPS server cached DN.
http.server.trace-level	Diagnostic trace level of HTTP server.
http.server.auth-req-tls	HTTP server authentication requires TLS.
http.server.clear-port	Server port for the HTTP protocol.
http.server.tls-port	Server port for the HTTPS protocol.

NOTE: For more details information on the eDirectory configuration parameters, refer to the `nds.conf` man page.

7.3 Security Considerations

The following security considerations are recommended:

- ♦ Make sure that only authenticated users have browse rights to the tree. To limit this, do the following:
 - ♦ Remove browse rights of [Public] on tree root.
 - ♦ Assign [Root] browse rights on tree root.
- ♦ Set `ldapBindRestrictions` attribute on the LDAP server object to “Disallow anonymous Simple Bind”. This prevents the clients from doing anonymous binds.
- ♦ By default, the cipher is set to Export. Make LDAP more secure by setting the cipher to HIGH. To do this, change the bind restrictions attribute of LDAP Server object to “Use Higher Cipher (greater than 128 bit)”.

Migrating to eDirectory 8.8 SP6

8

This document guides you to migrate your Novell eDirectory 8.7.3.x server to eDirectory 8.8 SP6 when you have to upgrade your operating system also.

With the change in the operating systems supported in eDirectory 8.8 SP6, there are certain versions that eDirectory 8.8 SP6 does not support that were earlier supported with eDirectory 8.7.3.x.

There are two scenarios while migrating to eDirectory 8.8 SP6:

- ♦ **Migrating to eDirectory 8.8 SP6 when platform upgrade is possible**

In this scenario, you upgrade your operating system to a supported version and then upgrade eDirectory to eDirectory 8.8 SP6.

- ♦ **Migrating to eDirectory 8.8 SP6 when platform upgrade is not possible**

In this scenario, you cannot upgrade your operating system to a supported version as the operating system migration path is not possible.

8.1 Migrating to eDirectory 8.8 SP6 While Upgrading the Operating System

In this scenario, you can migrate to eDirectory 8.8 SP6 after upgrading the operating system. The table below describes the migration path.

IMPORTANT: Ensure that you have upgraded eDirectory 8.7.3 with the latest set of patches.

Table 8-1 *Migration Path*

Operating System	Starting State	Intermediate State	Desired State
Windows	Windows 2000 SP4 + eDirectory 8.7.3.x	Windows 2003 SP2 + eDirectory 8.7.3.x	Windows 2003 SP2 + eDirectory 8.8 SP6
	Windows 2003 SP2 + eDirectory 8.7.3.x	Windows 2003 SP2 + eDirectory 8.8 SP6	Windows 2008 SP2 + eDirectory 8.8 SP6
	Precautions: Before upgrading eDirectory on UNIX and Linux, ensure that the hostname is configured to a valid IP address and not to loopback address in /etc/hosts file.		
Linux	SLES 9 + eDirectory 8.7.3.x	SLES 10 + eDirectory 8.7.3.x	SLES 10 + eDirectory 8.8 SP6
	RedHat AS 4.0 + eDirectory 8.8 SP2	RedHat AS 5.3 + eDirectory 8.8 SP2	RedHat AS 5.3 + eDirectory 8.8 SP6
Solaris	Solaris 9 + eDirectory 8.8 SP2	Solaris 10 + eDirectory 8.8 SP2	Solaris 10 + eDirectory 8.8 SP6

Operating System	Starting State	Intermediate State	Desired State
AIX	AIX 5.2 + eDirectory 8.7.3.x	AIX 5.2 + eDirectory 8.8 SP2	AIX 5.2 + eDirectory 8.8 SP2

Recommendations

1. Backup your eDirectory 8.7.3.x files before upgrading the operating system. Stop eDirectory and backup the following files:
 - ♦ `dib` directory
 - ♦ `nds.rfl` directory (by default this directory is present under the `dib` directory)
 - ♦ `nds.conf` file
 - ♦ `nici` directory
 - ♦ log files
2. Do not perform any operations on the intermediate state other than upgrading eDirectory, if the eDirectory version is not supported on a particular operating system in the intermediate state. For example, eDirectory 8.7.3.x on Solaris 10.

8.2 Migrating to eDirectory 8.8 SP6 Without Upgrading the Operating System

This method is used in scenarios where there is no operating system upgrade path to supported eDirectory 8.8 SP6 version.

For example, eDirectory 8.7.3.x is installed on Red Hat 7.3. A customer using Red Hat 7.3 wants to upgrade to eDirectory 8.8 SP6. eDirectory 8.8 SP6 is supported on Red Hat AS 5.x and there is no upgrade path from Red Hat 7.3 to Red Hat AS 5.x.

Complete the following steps to migrate to eDirectory 8.8 SP6:

- 1 Stop the eDirectory server
- 2 Take a backup of the following eDirectory 8.7.3.x files:
 - ♦ `dib` directory
 - ♦ `nds.rfl` directory (by default, this directory is present under the `dib` directory)
 - ♦ `nds.conf` file
 - ♦ `nici` directory
 - ♦ log files
- 3 Install the operating system
- 4 Remove the `nici` folder from `/var/novell` and restore the `nici` folder to `/var/opt/novell`
- 5 Ensure that `/var/novell/nici` is pointing to `/var/opt/novell/nici`
- 6 Install eDirectory 8.8 SP6 on the server (a new install)
- 7 Restore the `dib` and `nds.rfl` directories
- 8 Restore the `nds.conf` to the user specified location

9 Edit `/etc/opt/novell/eDirectory/conf/.edir/instances.0` and put the absolute path to `nds.conf` file.

10 Edit `nds.conf` file and add the following.

```
n4u.nds.dibdir=dib_file_location
n4u.server.libdir=/opt/novell/eDirectory/lib
n4u.server.vardir=var_directory
n4u.server.configdir=/etc/opt/novell/eDirectory/conf
http.server.module-base=http_server_module_base_directory
```

11 Set the path as follows:

Use `/opt/novell/eDirectory/bin/ndspath` utility.

12 Run `ndsconfig upgrade` after setting the path.

Migrating eDirectory from NetWare to OES 2 Linux

9

eDirectory™ migration from NetWare® requires the migration of eDirectory data and server identity to provide seamless accessibility after migration. The eDirectory migration utility performs all of the pre-migration tasks, health validations and server backups; server migration, and post-migration tasks for you.

The following sections give you more details on the migration procedure for eDirectory. For more information, see the *OES Migration Guide* (<http://www.novell.com/products/openenterpriseserver/migrate.html>).

- ♦ Section 9.1, “Planning Your Migration,” on page 113
- ♦ Section 9.2, “Migration Tools,” on page 114
- ♦ Section 9.3, “Migration Procedure,” on page 114
- ♦ Section 9.4, “After the Migration,” on page 116

9.1 Planning Your Migration

This section lists the important requirements that must be verified before attempting eDirectory migration.

- ♦ Section 9.1.1, “System Requirements,” on page 113
- ♦ Section 9.1.2, “Prerequisites,” on page 113
- ♦ Section 9.1.3, “Supported Platforms,” on page 114

9.1.1 System Requirements

- ❑ The target server must run OES 2 and should have the eDirectory 8.8 SP6 RPMs already installed.
- ❑ If the target OES 2 server has a default eDirectory 8.8 SP6 instance already configured, this instance should be active. This instance will be overwritten after the migration.
- ❑ OES 2 does not support multiple instances of eDirectory on the same server, so any non-default instances should not be running during migration.
- ❑ The source NetWare server should be running and should not be part of any partition operation. For more information on supported source NetWare server versions, refer to *eDirectory Coexistence and Migration* (http://www.novell.com/documentation/oes2/oes_implement_lx_nw/index.html?page=/documentation/oes2/oes_implement_lx_nw/data/edir.html#edir-coexistnmig).

9.1.2 Prerequisites

- ❑ The eDirectory migration utility will run only on the target server and must be able to access the NetWare server remotely.

9.1.3 Supported Platforms

The eDirectory migration utility is designed to run on the Linux version of OES 2, which is the target platform for migration. The following table lists the compatible eDirectory versions at source and the corresponding target servers:

Table 9-1 eDirectory Versions at Source and Target Servers

Source Server	Target Server
NetWare 5.1 SP8 + eDirectory 8.7.3.6	Physical or Virtualized OES2 Linux 32 or 64
NetWare 5.1 SP8 + eDirectory 8.7.3.7	Physical or Virtualized OES2 Linux 32 or 64
NetWare 6.5 SP6 + eDirectory 8.7.3.9	Physical or Virtualized OES2 Linux 32 or 64
NetWare 6.5 SP6 + eDirectory 8.8	Physical or Virtualized OES2 Linux 32 or 64
NetWare 6.5 SP6 + eDirectory 8.8 SP1	Physical or Virtualized OES2 Linux 32 or 64
NetWare 6.5 SP6 + eDirectory 8.8 SP3	Physical or Virtualized OES2 Linux 32 or 64

9.1.4 Considerations

- ♦ IP address and DNS migrations are not performed by this migration utility.
- ♦ Only the eDirectory instance will be migrated. Applications depending on eDirectory will not be migrated.
- ♦ You should not use this migration methodology if you want both the servers to be available during the migration operation.

NOTE: Only the target server will be available after the migration. The source server will be locked. Other service migrations cannot be performed after completing eDirectory migration.

9.2 Migration Tools

The eDirectory migration is performed independently of the OES migration framework. The complete migration task is performed by invoking the migedir command line utility.

9.3 Migration Procedure

- 1 Run the migedir utility by entering the following command on the target server:

```
migedir -s <IP address> [-A <log directory name>] [-t] [-v] [-h]
```

The utility takes the following command line options:

Option	Description
-s <i>IP address</i>	Specifies the IP address of the source server containing the eDirectory instance to be migrated.
IMPORTANT: -s is a mandatory parameter.	

Option	Description
-A <i>directory name</i>	Enables auditing. <i>directory name</i> specifies the directory in which log files should be created.
-t	Tests the validity of the input parameters.
	NOTE: This option verifies the IP address; however, it does not perform the actual migration.
-v	Enables the verbose mode.
-h	Prints help about using this utility.

2 Follow the on-screen instructions as the utility performs the migration.

The migration utility does some pre-migration checks, performs the migration, then does some post-migration tasks.

- ♦ [“Pre-migration” on page 115](#)
- ♦ [“Migration” on page 115](#)
- ♦ [“Post-migration” on page 116](#)
- ♦ [“Handling Failures” on page 116](#)

Pre-migration

The utility performs the following checks:

- ♦ The health and state of the replicas in the ring are verified.
- ♦ Configuration information for the server being migrated is collected and written to a configuration file to be used by other operations during the migration.
- ♦ Time synchronization is verified between the source and target servers.
- ♦ The target server is checked for any existing eDirectory instances.
 - ♦ If the instance exists, the user is prompted and the existing instance is removed before proceeding with the migration.
 - ♦ If the instance doesn't exist, a new instance is configured and used.

Migration

The utility performs the migration of the eDirectory instance from the collected configuration information. This involves backing up the source server data, locking the eDirectory instance in the source server, migrating data to the target server, and restoring the eDirectory instance on the target server. The dependent NICI files are also migrated.

The utility also configures the local instance in the target server with the source server details obtained during the previous checks.

Post-migration

After migration, the following tasks are performed by the utility:

- ♦ The `nds.conf` configuration file is modified with the source server eDirectory instance information, such as tree name and server name.
- ♦ The eDirectory instance in the target server is restarted so it can use the new data.
- ♦ Network address repair is performed to start the synchronization of the new IP address in the replica ring.

Handling Failures

During migration, the database in the source server is locked to avoid multiple copies of the instance running on the source and target servers. Multiple copies of the same instance can lead to data inconsistency. If the process fails and if you intend to bring up the source server again, you need to perform the following tasks:

- 1 Remove the partially migrated eDirectory instance on the target server.

Refer to [Removing a Server Object And Directory Services From a Tree \(http://www.novell.com/documentation/edir88/edirin88/data/a79kg0w.html#bxm6fn9\)](http://www.novell.com/documentation/edir88/edirin88/data/a79kg0w.html#bxm6fn9) for more information on how to remove the eDirectory instance from a server.

- 2 Restore and unlock the database in the source server.

Refer to [Backup and Restore Command Line Options \(http://www.novell.com/documentation/edir88/edir88/data/agatd4y.html\)](http://www.novell.com/documentation/edir88/edir88/data/agatd4y.html) for more information on how to unlock and restore the database.

The database backup is saved in the `sys:ni/data` folder.

9.4 After the Migration

After migration, the target eDirectory instance listens on the IP address of the target server and not on the source server's address. It requires additional time after migration for the eDirectory instance to synchronize the new IP address in the replica ring. Successful eDirectory migration can be verified by performing eDirectory operations on the new IP address.

IMPORTANT: If you want to use the existing security certificates, you must change the IP address of the target server to that of the source server. If you don't want to do this, you must issue new certificates.

NOTE: If you change the IP address of the target server after migration, you must modify the `nds.conf` file, restart the eDirectory instance, and repair the network address and partitions replica manually. For more information on repairing eDirectory instance, refer to [Advanced DSRepair Options \(http://www.novell.com/documentation/edir88/edir88/data/aflm3p7.html\)](http://www.novell.com/documentation/edir88/edir88/data/aflm3p7.html).

This chapter contains the following information:

- ♦ [Section 10.1, “Uninstalling eDirectory on Windows,” on page 117](#)
- ♦ [Section 10.2, “Uninstalling eDirectory on Linux, Solaris, or AIX,” on page 122](#)
- ♦ [Section 10.3, “Unattended Uninstallation of eDirectory on Unix,” on page 123](#)
- ♦ [Section 10.4, “Caveats for Uninstalling eDirectory,” on page 123](#)

10.1 Uninstalling eDirectory on Windows

Use the Windows Control Panel to remove eDirectory, ConsoleOne, SLP DA, and NICI from Windows servers.

IMPORTANT: Removing eDirectory also removes the roll-forward log directory and all the logs in it. If you want to be able to use the logs for restoring eDirectory on this server in the future, before removing eDirectory you must first copy the roll-forward logs to another location. For information about roll-forward logs, see “Using Roll-Forward Logs” in the *Novell eDirectory 8.8 Administration Guide*.

- ♦ [Section 10.1.1, “Uninstalling eDirectory, ConsoleOne, and SLP DA,” on page 117](#)
- ♦ [Section 10.1.2, “Unattended Uninstallation of eDirectory,” on page 117](#)
- ♦ [Section 10.1.3, “Uninstalling NICI,” on page 121](#)
- ♦ [Section 10.1.4, “Uninstalling Microsoft Visual C++ 2005 Runtime Libraries,” on page 121](#)

NOTE: The HTML files created using iMonitor will not be removed. You must manually remove these files from `<install directory>\novell\NDS\ndsimon\dsreports` before removing eDirectory.

10.1.1 Uninstalling eDirectory, ConsoleOne, and SLP DA

- 1 On the Windows server where eDirectory is installed, click *Start > Settings > Control Panel > Add/Remove Programs*.
- 2 Select *eDirectory*, *ConsoleOne*, or the *SLP Directory Agent* from the list, then click *Add/Remove*.
- 3 Confirm that you want to remove your selection by clicking *Yes*.
The Installation Wizard removes the program from the server.

10.1.2 Unattended Uninstallation of eDirectory

On Windows, the unattended uninstallation of eDirectory uses predefined text files that facilitate the unattended uninstallation.

You can perform either of the following setup using the unattended installation of eDirectory:

- ♦ Deconfiguration of the installed eDirectory.
- ♦ Standalone uninstallation of eDirectory.
- ♦ Both uninstallation and deconfiguration of eDirectory.

The following sections discuss various features of unattended eDirectory uninstallation:

- ♦ [“Response Files” on page 118](#)
- ♦ [“remove.rsp File Sections and Keys” on page 118](#)
- ♦ [“Add Features to the Automated Uninstallation” on page 119](#)
- ♦ [“Remove Configuration File Changes” on page 120](#)
- ♦ [“Unattended Uninstallation of eDirectory using Response File” on page 120](#)

Response Files

Uninstalling eDirectory on Windows operating system can be made silent and more flexible by using a response file (`remove.rsp`) to complete the following tasks:

- ♦ Complete unattended uninstallation with all required user inputs
- ♦ Default configuration of components
- ♦ Bypass all prompts during the installation

A response file is a text file containing sections and keys, similar to a `Windows.ini` file. You can create and edit a response file using any ASCII text editor. The eDirectory reads the uninstallation parameters directly from the response file and replaces the default uninstallation values with response file values. The uninstallation program accepts the values from the response file and continues to uninstall without prompts.

remove.rsp File Sections and Keys

The eDirectory uninstallation requires changes to the sections in the response file to add information about including the tree name, administrator context, administrator credentials (including user name and passwords), etc. A full list of the keys and their default values is available in the sample `remove.rsp` file that is delivered with the eDirectory installation.

NOTE: You should use the provided `remove.rsp` file available at `eDirectory\nt\i386\NDSonNT\remove.rsp` (for 32-bit) and `eDirectory\windows\x64\NDSonNT\remove.rsp` (for 64-bit) in the eDirectory installation. Essential parameters are set by default in this file. When editing the `remove.rsp` file, ensure there are no blank spaces between the key and the values along with the equals sign (“=”) in each key-value pair.

You provide the administrator user credentials in the `remove.rsp` file for an unattended uninstallation. Therefore, you must permanently delete the file after the uninstallation to prevent the administrator credentials from being compromised.

Add Features to the Automated Uninstallation

Most details for configuring the eDirectory Uninstaller have default setting for the manual uninstallation. However, during unattended uninstallation, each configuration parameter must be explicitly configured. This section discusses the basic settings to be unconfigured.

eDirectory Server Details

The details of the server being uninstalled must be provided to the Uninstaller. Most of this information is configured in three tags, [Novell:NDSforNT:1.0.0], [Initialization], and [Selected Nodes].

Take all the values mentioned in [Initialization] and [Selected Nodes] in remove.rsp as it they are.

[Novell:NDSforNT:1.0.0]

Tree Name: The name of the tree from which the server will be uninstalled.

Admin Login Name: The name (RDN) of the Administrator object in the tree that has full rights, at least to the context to which this server is added. All operations in the tree will be performed as this user.

Admin Context: Any user added to a tree has a user object that contains all the user-specific details. This parameter is the container object in the tree to which the Administrator object will be added. For primary server installations, this container will be created with the server object.

Admin Password: The password for the Administrator object created in the previous parameters. This password will be configured to the Administrator object during primary server installations. For secondary server installations, this needs to be the password of the Administrator object in the primary server that has rights to the context to which the new server is added.

NDS Location: The eDirectory install location in the local system where the libraries and binaries are copied. By default, eDirectory is installed into C:\Novell\NDS unless it is changed in the response file.

DataDir: Until eDirectory version 8.8, the DIB was installed inside the NDS location as a subfolder. Later, administrators were given the option to provide a different DIB location, because there might be too much data stored in the DIB to fit into the NDS location. Currently, by default the DIB is installed in the DIBFiles subfolder inside the NDS location, but administrators can change this parameter and provide a different location

mode: The type of setup on eDirectory. The three types of setup are:

- ♦ deconfigure: Performs the deconfiguration of eDirectory.
- ♦ uninstall: Performs uninstallation of eDirectory.
- ♦ full: Performs both deconfiguration and uninstallation of eDirectory.

NOTE: If you opt for the full setup mode during unattended install, then while uninstalling eDirectory you cannot opt for individual deconfiguration and uninstallation option.

ConfigurationMode: If the setup mentioned in the mode key is deconfigure, then ensure that you do not change the RestrictNodeRemove value of the ConfigurationMode key

Prompt: The type of the uninstallation mode should be mentioned in this variable. It will be set by default to 'silent' for unattended uninstallation. If any value other than 'silent' is set then it will do normal uninstallation

The following is a sample of text in the response file for all the basic parameters described above:

```
[Novell:NDSforNT:1.0.0]

Tree Name=SILENTCORP-TREE

Admin Context=Novell

Admin Login Name=Admin

Admin Password=novell

prompt=silent
```

Remove Configuration File Changes

In remove.cfg file residing in <Windows Install Drive>\Program Files\Common Files\novell\ni\bin, change

```
[PARAMETERS]0/OUTPUT_TO_FILE
```

to

```
[PARAMETERS]0/OUTPUT_TO_FILE /SILENT
```

Unattended Uninstallation of eDirectory using Response File

Copy the above edited file remove.rsp into <Windows Install Drive>\Program Files\Common Files\novell\ni\data.

The install.exe installed in the eDirectory is invoked in the command line with a few additional parameters. Depending on the required setup, you must use either of the following the command:

Deconfigure

```
<Windows Installed Drive>\Program Files\Common Files\novell\ni\bin>install.exe
-remove /restrictnoderemove /nopleasewait ..\data\ip.db ..\data\remove.rsp
Novell:NDSForNT:1.0.0 0 NDSonNT
```

Uninstall

- 1 Rename the ip.db file present in the <Windows Drive>\Program Files\Common Files\novell\ni\data directory to another name.
- 2 Copy the ip_conf.db file in the <Windows Drive>\Program Files\Common Files\novell\ni\data folder to ip.db.
- 3 Run the following command:

```
<Windows Installed Drive>\Program Files\Common
Files\novell\ni\bin>install.exe -remove /nopleasewait ..\data\ip.db
..\data\remove.rsp Novell:NDSForNT:1.0.0 0 NDSonNT
```


Deconfiguration and Uninstallation of eDirectory

```
<Windows Installed Drive>\Program Files\Common Files\novell\ni\bin>install.exe  
-remove /nopleasewait ..\data\ip.db ..\data\remove.rsp Novell:NDSForNT:1.0.0 0  
NDSonNT
```

After performing an uninstallation of eDirectory or combination setup, delete the following folders:

- ♦ C:\Novell\NDS (default location; else from the eDirectory installed directory)
- ♦ C:\Novell\NDS\DIBFiles (default location; else from the eDirectory DIB location)
- ♦ <Windows Installed Drive>:\Program Files\Common Files\Novell\ni
- ♦ <Windows Installed Drive>:\Windows\system32\NDScpa.cpl

10.1.3 Uninstalling NICI

- 1 On the Windows server where eDirectory is installed, click *Start > Settings > Control Panel > Add/Remove Programs*.
- 2 Select *NICI* from the list, then click *Add/Remove*.
- 3 Confirm that you want to remove NICI by clicking *Yes*.

The Installation Wizard removes NICI from the server.

After uninstalling NICI, if you want to completely remove NICI from your system, delete the C:\Windows\system32\novell\nici (32-bit) and C:\Windows\SysWOW64\novell\nici (64-bit) subdirectory. You might need to take ownership of some of the files and directories to delete them.

WARNING: After the NICI subdirectory has been removed, any data or information that was previously encrypted with NICI will be lost.

10.1.4 Uninstalling Microsoft Visual C++ 2005 Runtime Libraries

If Microsoft Visual C++ 2005 Runtime Libraries are not used by any other products other than eDirectory, uninstall them using the following procedure:

- 1 Navigate to *Add/Remove Programs* or *Programs and Features* on the Windows server where eDirectory is installed.
- 2 Remove the following redistribution package:
 - 32-bit:** Microsoft Visual C++ 2005 Redistributable
 - 64-bit:** Microsoft Visual C++ 2005 Redistributable and Microsoft Visual C++ 2005 Redistributable (x64)

10.2 Uninstalling eDirectory on Linux, Solaris, or AIX

Use the `nds-uninstall` utility to uninstall eDirectory components from Linux, Solaris, or AIX systems. This utility uninstalls eDirectory from the local host. You must deconfigure eDirectory server before running `nds-uninstall`. Run `ndsconfig rm -a <admin FDN>` to remove the eDirectory server. This utility is available at `/opt/novell/eDirectory/sbin/nds-uninstall`. However, `ndsconfig rm` is not supported on OES2 SP2 or later versions.

IMPORTANT: Removing eDirectory also removes the roll-forward log directory and all the logs in it. If you want to be able to use the logs for restoring eDirectory on this server in the future, before removing eDirectory you must first copy the roll-forward logs to another location. For information about roll-forward logs, see “Using Roll-Forward Logs” in the *Novell eDirectory 8.8 Administration Guide*.

1 Execute the `nds-uninstall` command.

2 Use the following syntax:

```
nds-uninstall [-s][-h]
```

If you do not provide the required parameters in the command line, the `nds-install` utility will prompt for the parameters.

Parameter	Description
-h	Displays the help strings.
-s	Skips the removal of DIBs while the eDirectory is uninstalled. This option facilitates the removal of the eDirectory packages without interrupting the DIBs. The 'nds-install' script must be executed to perform an eDirectory upgrade. This option is best suited when the eDirectory packages are required to be replaced for some reason with the same version, usually in the testing scenarios.

NOTE: The DIBs without the eDirectory binaries cannot be used and are insignificant.

IMPORTANT: Ensure that using this option is not affecting other services for a long period.

`nds-uninstall` does not uninstall the following packages:

Package	Reasons for Not Removing
NICI package	NICI could be used by any of the following: <ul style="list-style-type: none">♦ Any other product♦ eDirectory installed in a custom location♦ eDirectory installed by a nonroot user
NOVLsubag	NOVLsubag could be used by any of the following: <ul style="list-style-type: none">♦ eDirectory installed in a custom location♦ eDirectory installed by a nonroot user

10.3 Unattended Uninstallation of eDirectory on Unix

- 1 Remove the instances of eDirectory:

```
ndsconfig rm -a <user name> -w passwd -c
```

- 2 Use either of the following in the automated script for the de-configuration of eDirectory :

Passing the password through environment variable: `ndsconfig rm -a <user name> -w env:<environment variable> -c`

Passing the password through file: `ndsconfig rm -a <user name> -w file:<filename with absolute/relative path> -c`

- 3 (optional) In case of multiple instances, run the following command for individual instances:

```
ndsconfig rm -a <user name> -w passwd --config-file <absolute path for configuration file>
```

For example:

```
ndsconfig rm -a admin.novell -w n -c
```

```
ndsconfig rm -a admin.novell -w env:ADM_PASWD -c
```

```
ndsconfig rm -a admin.novell -w file:/Builds/88SP6/adm_passwd -c
```

- 4 To uninstall the eDirectory packages, run the `nds-uninstall` script to remove the eDirectory packages:

```
nds-uninstall -u
```

10.4 Caveats for Uninstalling eDirectory

When you uninstall eDirectory and install it again, the eDirectory server cannot be accessible to the other servers in the network. All the distributed operations such as synchronization and obituary processing do not take place on the partitions whose replicas are present in the eDirectory server. If this state persists for a while, it might impact all the servers and the processes running on them.

Avoid uninstalling a newer version of eDirectory and install an earlier version, because:

- ♦ Does not revert the schema related upgrades.
- ♦ eDirectory might not be functional if DIB is upgraded to the newer version.
- ♦ Removes all the existing configuration files, except for the `nds.conf`.

However, consider the following when you uninstall a newer version of eDirectory and install an earlier version:

- ♦ Upgrade the DIB to the newer version. Else, eDirectory might not be functional.
- ♦ Back up the existing configuration files, except for the `nds.conf`, and restore when eDirectory is installed again.
- ♦ Does not revert the schema related upgrades.

Earlier eDirectory instrumentation was a part of Novell Audit. However, from eDirectory 8.8 SP3 version onwards, eDirectory Instrumentation must be installed separately.

Use the following information to install or configure or uninstall Novell eDirectory Instrumentation on Linux, Solaris, and Windows servers:

- ♦ [Section 11.1, “Supported Platforms,” on page 125](#)
- ♦ [Section 11.2, “Prerequisites,” on page 126](#)
- ♦ [Section 11.3, “Installing eDirectory Instrumentation,” on page 127](#)
- ♦ [Section 11.4, “Configuring eDirectory Instrumentation,” on page 129](#)
- ♦ [Section 11.5, “Uninstalling eDirectory Instrumentation,” on page 131](#)

11.1 Supported Platforms

- ♦ [Section 11.1.1, “32-Bit eDirectory,” on page 125](#)
- ♦ [Section 11.1.2, “64-bit eDirectory,” on page 126](#)

11.1.1 32-Bit eDirectory

- ♦ [“Linux” on page 125](#)
- ♦ [“Solaris” on page 126](#)
- ♦ [“Windows” on page 126](#)

Linux

32-bit

- ♦ SUSE® Linux Enterprise Server (SLES) 11
- ♦ SLES 10 SP1, SP2 and SP3
- ♦ SLES 10 SP1, SP2 and SP3 XEN
- ♦ Red Hat Enterprise Linux (RHEL) 5**
- ♦ RHEL 5** AP
- ♦ RHEL 5** AP Virtualization
- ♦ RHEL 6.0

64-bit

- ♦ SLES 11 64-bit
- ♦ SLES 10 SP1, SP2, SP3 64-bit
- ♦ SLES 10 SP1, SP2 and SP3 XEN 64-bit
- ♦ RHEL 5** 64-bit
- ♦ RHEL 5** AP 64-bit

- ♦ RHEL 5** AP Virtualization 64-bit
- ♦ RHEL 6.0

Solaris

- ♦ Solaris* 10 on Sun SPARC

Windows

- ♦ 32-bit Windows* 2003 Enterprise Server SP2
- ♦ 32-bit Windows* 2008 Server (Standard/Enterprise/Data Center Edition)

** - Latest service pack

11.1.2 64-bit eDirectory

Linux

- ♦ SLES 11 64-bit
- ♦ SLES 10 SP1, SP2 and SP3 64-bit
- ♦ SLES 10 SP1, SP2 and SP3 XEN 64-bit
- ♦ RHEL 5** 64-bit
- ♦ RHEL 5** AP 64-bit
- ♦ RHEL 5** AP Virtualization 64-bit
- ♦ RHEL 6.0

Solaris

- ♦ Solaris* 10 on Sun SPARC

Windows

- ♦ 64-bit Windows* 2008 Server (Standard/Enterprise/Data Center Edition)
- ♦ Windows 2008 R2 Server (Standard/Enterprise/Data Center Edition)

** - Latest service pack

11.2 Prerequisites

- ☐ eDirectory 8.8 SP6 Instrumentation supports only the Audit Platform Agent.
- ☐ Installing and using the Novell Audit iManager Plug-in requires iManager 2.7.3 or later. Refer to the [Novell iManager Documentation Page \(http://www.novell.com/documentation/imanager27/index.html\)](http://www.novell.com/documentation/imanager27/index.html) for more information.

11.3 Installing eDirectory Instrumentation

- ♦ [Section 11.3.1, “Linux,” on page 127](#)
- ♦ [Section 11.3.2, “Solaris,” on page 128](#)
- ♦ [Section 11.3.3, “Windows,” on page 128](#)

11.3.1 Linux

If the Audit Platform Agent configuration file (`logevent.conf`) already exists in the `/etc`, then back-up the file before installing Instrumentation, as the new package overwrites the existing configuration.

If the Instrumentation is already loaded, unload `auditds` module by using `ndstrace -c "unload auditds"` command.

For 32-bit Instrumentation:

- 1 Install `novell-AUDTplatformagent-2.0.2-62.i586.rpm` from the setup directory of the extracted eDirectory build for the Linux platform.

```
#rpm -Uvh /root/eDirectory/setup/novell-AUDTplatformagent-2.0.2-62.i586.rpm
```
- 2 Install `novell-AUDTedirinst-8.8.6-xx.i586.rpm` from the setup directory of the extracted eDirectory build for the Linux platform.

```
#rpm -Uvh /root/eDirectory/setup/novell-AUDTedirinst-8.8.6-xx.i586.rpm
```

For 64-bit Instrumentation:

- 1 Install `novell-AUDTplatformagent-2.0.2-62.x86_64.rpm` from the setup directory of the extracted eDirectory build for the Linux platform.

```
#rpm -Uvh /root/eDirectory/setup/novell-AUDTplatformagent-2.0.2-62.x86_64.rpm
```
- 2 Install the `novell-AUDTedirinst-8.8.6-xx.x86_64.rpm` from the setup directory of the extracted eDirectory build for the Linux platform.

```
#rpm -Uvh <eDirectory build extracted folder>/eDirectory/setup/novell-AUDTedirinst-8.8.6-xx.x86_64.rpm
```

Run `ndstrace -c "load auditds"` to load the `auditds` module. This step is common for both 32 and 64-bit eDirectory Instrumentation installation.

IMPORTANT: ♦ For OES2 SP3 32-bit, you must download eDirectory standalone build for Linux 32-bit from the download.novell.com for 32-bit eDirectory. Extract the build and use the `novell-AUDTedirinst-8.8.6-xx.i586.rpm`.

- ♦ For OES2 SP3 64-bit, you must download eDirectory standalone build for Linux 64-bit from the download.novell.com for 64-bit eDirectory. Extract the build and use the `novell-AUDTedirinst-8.8.6-xx.x86_64.rpm`.
-

11.3.2 Solaris

If the Audit Platform Agent configuration file (`logevent.conf`) already exists in the `/etc`, then back-up the file before installing Instrumentation, as the new package overwrites the existing configuration.

If the Audit Platform Agent is already loaded, unload `auditds` module by using `ndstrace -c "unload auditds"` command.

For 32-bit Instrumentation

Install `NOVLaudp.a` from the setup directory of the extracted eDirectory build for the Solaris platform.

For example,

```
#pkgadd -a <eDirectory build extracted folder>/eDirectory/setup/admin.audit -d  
<path to the downloaded Audit Platform Agent location>/NOVLaudp.a all
```

```
#pkgadd -a <eDirectory build extracted folder>/eDirectory/setup/admin.audit -d  
<eDirectory build extracted folder>/eDirectory/setup/NOVLaudin.a
```

For 64-bit Instrumentation

Install `NOVLaudp.a` from the setup directory of the extracted eDirectory build for the Solaris platform.

For example,

```
#pkgadd -a <eDirectory build extracted folder>/eDirectory/setup/admin.audit -d  
<path to the downloaded Audit Platform Agent location>/NOVLaudp.a all
```

```
#pkgadd -a <eDirectory build extracted folder>/eDirectory/setup/admin.audit -d  
<eDirectory build extracted folder>/eDirectory/setup/NOVLaudin.a
```

11.3.3 Windows

If the Audit Platform Agent configuration file (`logevent.cfg`) already exists in the `C:\windows`, then back-up the file before installing Instrumentation, as the new package overwrites the existing configuration.

For 32-bit installation of eDirectory Instrumentation and Audit Platform Agent:

- 1 Run the `pa_win32.exe` file for 32-bit Audit Platform Agent from the installer folder.
- 2 Unzip the `edirectoryinstrumentation-win-8.8.6.zip` file for 32-bit Instrumentation from the `<installerFolder>/nt/auditds/`. Unzipping this file creates a Novell directory.
- 3 Copy the `Novell\NDS\nauditds.dlm` to the `C:\Novell\NDS` directory (or to any other directory where eDirectory is installed).
- 4 Copy the `Novell\NDS\ediraudit.sch` file to the `C:\Novell\NDS` directory (or to any other directory where eDirectory is installed) on the Windows server.

For 64-bit installation of eDirectory Instrumentation and Audit Platform Agent:

- 1 Run the `pa_win64.exe` file for 64-bit Audit Platform Agent.

- 2 Unzip the eDirectoryInstrumentation-win-8.8.6.zip file for 64-bit Instrumentation from the <installerFolder>/nt/auditds/. Unzipping this file creates a Novell directory.
- 3 Copy the Novell\NDS\nauditds.dlm to the C:\Novell\NDS directory (or to any other directory where eDirectory is installed).
- 4 Copy the Novell\NDS\ediraudit.sch file to the C:\Novell\NDS directory (or to any other directory where eDirectory is installed) on the Windows server.

11.4 Configuring eDirectory Instrumentation

- ♦ [Section 11.4.1, “Linux and Solaris,” on page 129](#)
- ♦ [Section 11.4.2, “Windows,” on page 130](#)

11.4.1 Linux and Solaris

- 1 Extend the eDirectory Instrumentation schema file by using the ndssh utility as follows


```
ndssh -t CORP-TREE admin.novell /opt/novell/eDirectory/lib/nds-schema/ediraudit.sch
```

The schema file locations for Linux and Solaris are as follows:

 - ♦ Linux32: /opt/novell/eDirectory/lib/nds-schema/ediraudit.sch
 - ♦ Linux64: /opt/novell/eDirectory/lib64/nds-schema/ediraudit.sch
 - ♦ Solaris32: /opt/novell/eDirectory/lib/nds-schema/ediraudit.sch
 - ♦ Solaris64: /opt/novell/eDirectory/sparcv9/nds-schema/ediraudit.sch
- 2 Select the eDirectory events that you want to audit by using iManager.
 - 2a Launch iManager and log in.
 - 2b Under *Roles and Tasks*, select *Directory Administration > Modify Object*.
 - 2c Select NCP Server object that corresponds to the eDirectory Server you want to audit. Click *OK*.
 - 2d Click Novell Audit tab, then click eDirectory sub tab to display the eDirectory Instrumentation Settings page.
 - 2e Select or deselect the events that you want to audit. Click *Apply*, then click *OK*.
- 3 If Audit Platform Agent is not already configured, edit the /etc/logevent.conf Platform Agent configuration file to set the Audit Server's host address in the *LogHost* appropriately.

For example:

```
LogHost=192.168.1.8
```

For more information, refer to the [Configuring the Audit Platform Agent \(http://www.novell.com/documentation/novellaudit20/novellaudit20/data/al36zjk.html\)](http://www.novell.com/documentation/novellaudit20/novellaudit20/data/al36zjk.html) in the *Novell Audit 2.0 Administration Guide*.
- 4 Run the following command to load the eDirectory Instrumentation if it is not already loaded:


```
ndstrace -c "load auditds"
```
- 5 Run the following command to unload the eDirectory instrumentation:


```
ndstrace -c "unload auditds"
```

NOTE: [Step 4](#) and [Step 5](#) are common for both 32 and 64-bit eDirectory Instrumentation configuration.

To automatically load eDirectory instrumentation everytime eDirectory is started, edit the `/etc/opt/novell/eDirectory/conf/ndsmodules.conf` file and add the following line:

```
auditds      auto      #eDirectory Instrumentation
```

11.4.2 Windows

- 1** Extend the `C:\Novell\NDS\ediraudit.sch` eDirectory instrumentation schema file by using the `NDSCons.exe` utility as follows:
 - 1a** Click *Start > Settings > Control Panel > Novell eDirectory Services*.
 - 1b** Click `install.dlm`, then click *Start*.
 - 1c** Click *Install Additional Schema Files*, then click *Next*.
 - 1d** Log in as a user with administrative rights, then click *OK*.
 - 1e** Specify the schema file path and the name.
For example, `C:\Novell\NDS\ediraudit.sch`
 - 1f** Click *Finish*.
For more information, refer to the [Manually Extending the Schema \(http://www.novell.com/documentation/edir88/edir88/data/amijij0.html\)](http://www.novell.com/documentation/edir88/edir88/data/amijij0.html) in the *eDirectory 8.8 Administration Guide*.
- 2** Select the eDirectory events that you want to audit by using iManager (refer to [Step 2 on page 129](#)).
- 3** If Audit Platform Agent is not already configured, edit the `Windows_directory\logevent.cfg` Audit Platform Agent configuration file (for example, `C:\windows\logevent.cfg`) and set the Audit Server's host address in the *LogHost* appropriately.
For example,
`LogHost=192.168.1.8`
For more information, refer to the [Configuring the Audit Platform Agent \(http://www.novell.com/documentation/novellaudit20/novellaudit20/data/al36zjk.html\)](http://www.novell.com/documentation/novellaudit20/novellaudit20/data/al36zjk.html) in the *Novell Audit 2.0 Administration Guide*.
- 4** To load the eDirectory Instrumentation, click *Start > Control Panel > Novell eDirectory Services*. Select *nauditds* from the Services tab, then click *Start*.
- 5** To unload the eDirectory Instrumentation, click *Start > Control Panel > Novell eDirectory Services*. Select *nauditds* from the Services tab, then click *Stop*.
- 6** To automatically load eDirectory Instrumentation every time eDirectory is started, click *Start > Control Panel > Novell eDirectory Services*. Select *nauditds* from the Services tab, then click *Startup...* and Select *Automatic*. Click *OK*.
- 7** To disable automatic loading of eDirectory Instrumentation every time eDirectory is started, click *Start > Control Panel > Novell eDirectory Services*. Select *nauditds* from the Services tab, then click *Startup...* and deselect the *Automatic* check box. Click *OK*.

11.5 Uninstalling eDirectory Instrumentation

The following sections explain how to uninstall eDirectory Instrumentation:

- ♦ [Section 11.5.1, “Uninstalling eDirectory Instrumentation on Linux,” on page 131](#)
- ♦ [Section 11.5.2, “Uninstalling eDirectory Instrumentation on Solaris,” on page 131](#)
- ♦ [Section 11.5.3, “Uninstalling eDirectory Instrumentation on Windows,” on page 132](#)

11.5.1 Uninstalling eDirectory Instrumentation on Linux

To uninstall eDirectory instrumentation,

- 1 Unload eDirectory instrumentation using the command `ndstrace -c unload auditds`.
- 2 Uninstall the `novell-AUDTedirinst-8.8.6-xx` rpm.

NOTE: The rpm name is same for both 32 and 64-bit instrumentation.

```
#rpm -e --nodeps novell-AUDTedirinst-8.8.6-xx
```

- 3 Disable automatic loading of eDirectory instrumentation everytime eDirectory is started by editing the `/etc/opt/novell/eDirectory/conf/ndsmodules.conf` file and removing the line corresponding to `auditds` (if it exists). The line corresponding to `auditds` is as follows:

```
auditds      auto      #eDirectory Instrumentation
```

NOTE: If no other instrumentation is installed then uninstall the `novell-AUDTplatformagent-2.0.2-62` Audit Platform Agent by using `#rpm -e novell-AUDTplatformagent-2.0.2-62` command. The rpm name is same for both 32 and 64-bit instrumentation.

11.5.2 Uninstalling eDirectory Instrumentation on Solaris

To uninstall eDirectory instrumentation,

- 1 Unload eDirectory instrumentation using the command `ndstrace -c "unload auditds"`.
- 2 Uninstall the package `NOVLaudin` for 32-bit Instrumentation and `NOVLaudinx` for 64-bit Instrumentation .

For example the package can be uninstalled using the command,

```
#pkgrm NOVLaudin
```

```
#pkgrm NOVLaudinx
```

- 3 Disable automatic loading of eDirectory instrumentation everytime eDirectory is started by editing the `/etc/opt/novell/eDirectory/conf/ndsmodules.conf` file and removing the line corresponding to `auditds` (if it exists). The line corresponding to `auditds` is as follows:

```
auditds      auto      #eDirectory Instrumentation
```

NOTE: If no other instrumentation is installed then uninstall the `NOVLaudpa` Audit Platform Agent package for 32-bit Instrumentation and `NOVLaudpax` Audit Platform Agent package for 64-bit Instrumentation . For example, the package can be removed using the `#pkgrm NOVLaudpa` command and `#pkgrm NOVLaudpa` command.

11.5.3 Uninstalling eDirectory Instrumentation on Windows

The procedures to uninstall 32-bit Instrumentation and 64-bit Instrumentation are the same on a Windows platform.

To uninstall eDirectory instrumentation,

- 1 Unload eDirectory instrumentation as follows:
 - ♦ Navigate to *Start > Control Panel > Novell eDirectory Services*.
 - ♦ Select *Services*.
 - ♦ Click `nauditds.dlm`, then click *Stop*.
- 2 Delete `nauditds.dlm` from the `C:\Novell\NDS` directory.
- 3 Delete the `ediraudit.sch` file from the `C:\Novell\NDS` directory.

Disable automatic loading of eDirectory instrumentation everytime eDirectory is started, as follows:

- ♦ Navigate to *Start > Control Panel > Novell eDirectory Services*.
- ♦ Select *Services*.
- ♦ Click on `nauditds.dlm` and then click *Startup*.
- ♦ Disable the `Automatic` option by clearing the check box.
- ♦ Click *OK*.

NOTE: If no other Instrumentation is installed then uninstall the Audit Platform Agent by deleting the `logevent.dll` file at `C:\Novell\NDS`.

Linux, Solaris, and AIX Packages for Novell eDirectory

A

Novell eDirectory includes a Linux, Solaris, and AIX package system, which is a collection of tools that simplify the installation and uninstallation of various eDirectory components. Packages contain makefiles that describe the requirements to build a certain component of eDirectory. Packages also include configuration files, utilities, libraries, daemons, and man pages that use the standard Linux, Solaris, or AIX tools installed with the OS.

The following table provides information about the Linux, Solaris, and AIX packages that are included with Novell eDirectory.

NOTE: On Linux, all the packages are prefixed with *novell-*. For example, NDSserv is novell-NDSserv.

Package	Description
NOVLice	Contains the Novell Import Convert Export utility and is dependent on the NOVLimgnt, NOVLxis, and NLDAPbase packages.
NDSbase	<p>Represents the Directory User Agent. This package is dependent on the NICI package.</p> <p>The NDSbase package contains the following:</p> <ul style="list-style-type: none">♦ Authentication toolbox containing the RSA authentication needed for eDirectory♦ Platform-independent system abstraction library, a library containing all the defined Directory User Agent functions, and the schema extension library♦ Combined configuration utility and the Directory User Agent test utility♦ eDirectory configuration file and manual pages
NDScommon	Contains the man pages for the eDirectory configuration file, install, and uninstall utilities. This package is dependent on the NDSbase package.
NDSmasv	Contains the libraries required for mandatory access control (MASV).

Package	Description
NDSserv	<p>Contains all the binaries and libraries needed by the eDirectory Server. It also contains the utilities to manage the eDirectory Server on the system. This package is dependent on the NDSbase, NDScommon, NDSmasv, NLDAPsdk, NOVLpkia and NOVLpkit packages.</p> <p>The NDSserv package contains the following:</p> <ul style="list-style-type: none"> ♦ NDS install library, FLAIM library, trace library, NDS library, LDAP server library, LDAP install library, index editor library, DNS library, merge library, and LDAP extension library for LDAP SDK ♦ eDirectory Server daemon ♦ Binary for DNS and a binary to load or unload LDAP ♦ The utility needed to create the MAC address, the utility to trace the server and change some of the global variables of the server, the utility to back up and restore eDirectory, and the utility to merge eDirectory trees ♦ Startup scripts for DNS, NDSD, and NLDAP ♦ Man pages
NDSimon	Contains the runtime libraries and utilities used to search and retrieve data from eDirectory services. This package is dependent on the NDSbase package.
NDSrepair	Contains the runtime libraries and the utility that corrects problems in the eDirectory database. This package is dependent on the NDSbase package.
NLDAPbase	<p>Contains LDAP libraries, extensions to LDAP libraries, and the following LDAP tools:</p> <ul style="list-style-type: none"> ♦ Idapdelete ♦ Idapmodify ♦ Idapmodrdn ♦ Idapsearch <p>This package is dependent on the NLDAPsdk package.</p>
NOVLnmas	Contains all the NMAS libraries and the nmasinst binaries needed for NMAS server. This package is dependent on the NICI and NDSmasv packages.
NLDAPsdk	Contains Novell extensions to LDAP runtime and Security libraries (Client NICI).
NOVLsubag	Contains the runtime libraries and utilities for the eDirectory SNMP subagent. This package is dependent on the NICI, NDSbase, and NLDAPbase packages.
NOVLpkit	Provides PKI Services which do not require eDirectory. This package is dependent on the NICI and NLDAPsdk packages.
NOVLpkis	Provides PKI Server Service. This package is dependent on the NICI, NDSbase, and NLDAPsdk packages.
NOVLsnmp	The runtime libraries and utilities for SNMP. This package is dependent on the NICI package.
NDSdexvnt	Contains the library that manages events generated in Novell eDirectory to other databases.
NOVLpkia	Provides PKI services. This package is dependent on the NICI, NDSbase, and NLDAPsdk packages.
NOVLembox	Provides the eMBox infrastructure and eMTools.

Package	Description
NOVLimgnt	Contains runtime libraries for Novell Language Management.
NOVLxis	Contains the runtime libraries for Novell XIS.
NOVLsas	Contains the Novell SAS libraries.
NOVLntls	Contains Novell TLS library. This package is identified as: <ul style="list-style-type: none"> ♦ NOVLntls on Solaris, and AIX ♦ ntls on Linux
NOVLdif2dib	Contains the Novell Offline Bulkload utility and is dependent on the NDSbase, NDSserv, NOVLntls, NOVLimgnt and NICI packages.
NOVLncp	Contains the Novell Encrypted NCP Services for Unix. This package is dependent on the NDScommon package.

eDirectory Health Checks

B

Novell eDirectory 8.8 provides a diagnostic tool to help you determine whether your eDirectory health is safe. The primary use of this tool is to check if the health of the server is safe before upgrading.

eDirectory health checks are run by default with every upgrade and they occur before the actual package upgrade. However, you can run the diagnostic tool, `ndscheck`, to do the health checks at anytime.

B.1 Need for Health Checks

In earlier releases of eDirectory, the upgrade did not check the health of the server before proceeding with the upgrade. If the health was unstable, the upgrade operation would fail and eDirectory would be in an inconsistent state. In some cases, you probably could not roll back to the pre-upgrade settings.

This new health check tool resolves this, letting you to ensure that your server is ready to upgrade.

B.2 Performing Health Checks

You can perform eDirectory health checks in two ways:

NOTE: You need administrative rights to run the health check utility.

- ♦ [Section B.2.1, “With the Upgrade,” on page 137](#)
- ♦ [Section B.2.2, “As a Standalone Utility,” on page 137](#)

B.2.1 With the Upgrade

The health checks are run by default every time you upgrade eDirectory.

Linux and UNIX

Every time you upgrade, the health checks are run by default before the actual upgrade operation starts.

To skip the default health checks, you can use the `-j` option with `nds-install`.

Windows

The eDirectory health checks happen as part of the installation wizard. You can enable or disable the health checks when prompted to do so.

B.2.2 As a Standalone Utility

You can run the eDirectory health checks as a standalone utility anytime you want. The following table lists the health check utility names for each platform.

Table B-1 *Health Check Utilities*

Platform	Utility Name
Linux and UNIX	<p>ndsccheck</p> <p>Syntax:</p> <pre>ndsccheck [--help -?] Display command usage ndsccheck [--version -v] Display version information ndsccheck [-h <hostname port>] [-a <admin FDN>] [-F <log file>] [-D] [-q] [--config- file <file name>]</pre>
Windows	<p>ndsccheck</p> <p>Syntax:</p> <pre>ndsccheck [--help -?] Display command usage ndsccheck [--version -v] Display version information ndsccheck [-h <hostname port>] [-a <admin FDN>] [-F <log file>] [-D] [-q] [--config- file <file name>]</pre>

B.3 Types of Health Checks

When you run the `ndsccheck` utility or upgrade, the following types of health checks are done:

- ♦ [Basic Server Health](#)
- ♦ [Partitions and Replica Health](#)

When you run the `ndsccheck` utility, the results are displayed on the screen and logged in `ndsccheck.log`. For more information on log files, refer to [Section B.5, “Log Files,” on page 141](#).

If the health checks are done as part of the upgrade, you are either prompted to continue the upgrade process or the process is aborted, depending on the types of errors found (if any). Error types are described in [Section B.4, “Categorization of Health,” on page 139](#).

B.3.1 Basic Server Health

This is the first stage of the health check, where the health check utility checks for the following:

1. The eDirectory service is up. The DIB is open and able to read some basic tree information such as tree name.
2. The server is listening on the respective port numbers.

For LDAP, it gets the TCP and the SSL port numbers and checks if the server is listening on these ports.

Similarly, it gets the HTTP and HTTP secure port numbers and checks if the server is listening on these ports.

B.3.2 Partitions and Replica Health

After checking the basic server health, it then checks the partitions and replica health as follows:

1. Checks the health of the replicas of the locally held partitions.
2. Reads the replica ring of every partition held by the server and checks whether all servers in the replica ring are up and all the replicas are in the ON state.
3. Checks the time synchronization of all the servers in the replica ring, showing any time difference between the servers.

B.4 Categorization of Health

There are three possible categories of health, based on the errors found while checking the health of an eDirectory server:

- ♦ [Normal \(page 139\)](#)
- ♦ [Warning \(page 139\)](#)
- ♦ [Critical \(page 140\)](#)

The status of the health checks is logged into a logfile. For more information, refer to [Section B.5, “Log Files,” on page 141](#).

B.4.1 Normal

All the health checks were successful and the server health is normal.

The upgrade proceeds without an interruption.

B.4.2 Warning

Minor errors were found while checking the server health.

If the health check is run as part of the upgrade, you are prompted to either abort or continue. For more information, see [Figure B-1 on page 140](#).

Warnings normally occur in the following scenarios:

- ♦ Server not listening on LDAP and HTTP ports (normal, secure, or both).
- ♦ Unable to contact any of the nonmaster servers in the replica ring.
- ♦ Servers in the replica ring are not in sync.

Figure B-1 Health Check with a Warning

```
osg-dt-srv27</>ndsconfig upgrade -a admin.org
[[1] Instance at /etc/opt/novell/eDirectory/conf/nds.conf: osg-dt-srv27.org.SOLT0615
Enter the password for admin.org:

Starting health check...
Mon Jun 21 08:20:48 2004
Performing health check on the eDirectory server ".CN=osg-dt-srv27.0=org.I=SOLT0615." ...

-----
Checking the LDAP and HTTP configuration...
WARNING: eDirectory server is not listening on the LDAP port 389
WARNING: eDirectory server is not listening on the LDAP port 636
Checking health of partitions ...

Status of partition ".I=SOLT0615." ... [OK]
Checking the status of the replica ring...
Number of replicas = 2
+-----+-----+-----+-----+-----+
+-----+
Server Name                                Status   Time Sync   Time Delta   Replica S
tate
+-----+-----+-----+-----+-----+
+-----+
.CN=osg-dt-srv27.0=org.I=SOLT0615.         UP       YES         0 m:0 s      ON
.CN=osg-dt-srv9.0=org.I=SOLT0615.          UP       YES         0 m:23 s     ON
+-----+-----+-----+-----+-----+
+-----+

Checking replication delta on the partition...
Maximum replica ring delta "0:3:35 <hh:mm:ss>"
Perishable delta on this server: "0:3:35 <hh:mm:ss>"

eDirectory health check completed.

Errors were detected during the server health check. Refer log file "/var/opt/novell/eDirectory/data/./log/ndscheck.log" for more details.

For a possible solution refer the following locations -
1. Cool solutions: http://www.novell.com/cool solutions/nds/
2. Support forums: http://support.novell.com/forums/2ed.html
3. Documentation (trouble shooting section): http://www.novell.com/documentation/edirectory.html
4. Error codes: http://www.novell.com/documentation/lg/nwec/index.html
5. Patches: http://support.novell.com/filefinder/5069/index.html

WARNING: Errors were detected during the server health check.
Continue (y/n)? _
```

B.4.3 Critical

Critical errors were found while checking the eDirectory health.

If the health check is run as part of the eDirectory upgrade, the upgrade operation is aborted. For more information, see [Figure B-2 on page 141](#).

The critical state normally occurs in the following scenarios:

- ♦ Unable to read or open the DIB (might be locked or corrupt).
- ♦ Unable to contact all the servers in the replica ring.
- ♦ Locally held partitions are busy.
- ♦ Replica is not in the ON state.

Figure B-2 Health Check with a Critical Error

```
osg-dt-srv27</>ndsconfig upgrade -a admin.org
[1] Instance at /etc/opt/novell/eDirectory/conf/nds.conf: osg-dt-srv27.org.SOLT0615
Enter the password for admin.org:

Starting health check...
Mon Jun 21 08:14:46 2004
Performing health check on the eDirectory server ".CN=osg-dt-srv27.0=org.T=SOLT0615." ...

-----
Checking the LDAP and HTTP configuration... [OK]
Checking health of partitions ...

Status of partition ".T=SOLT0615." ... [OK]
Checking the status of the replica ring...
Number of replicas = 2
+-----+-----+-----+-----+-----+
| Server Name | Status | Time Sync | Time Delta | Replica S |
| tate        |        |           |            |            |
+-----+-----+-----+-----+-----+
|.CN=osg-dt-srv27.0=org.T=SOLT0615. | UP    | YES      | 0 m:0 s   | ON        |
|.CN=osg-dt-srv9.0=org.T=SOLT0615.  | DOWN  | -        | -         | ON        |
+-----+-----+-----+-----+-----+

Checking replication delta on the partition...
Maximum replica ring delta "0:0:23 (hh:mm:ss)"
Perishable delta on this server: "0:0:0 (hh:mm:ss)"

eDirectory health check completed.

Errors were detected during the server health check. Refer log file "/var/opt/novell/eDirectory/data/.../log/ndscheck.log" for more details.

For a possible solution refer the following locations -
1. Cool solutions: http://www.novell.com/cool solutions/nds/
2. Support forums: http://support.novell.com/forums/2ed.html
3. Documentation (trouble shooting section): http://www.novell.com/documentation/edir88tshoot/data/front.html
4. Error codes: http://www.novell.com/documentation/lg/nwec/index.html
5. Patches: http://support.novell.com/filefinder/5069/index.html

ERROR 2: Check the errors before continuing with the eDirectory upgrade.
osg-dt-srv27</>_
```

B.5 Log Files

Every eDirectory health check operation, whether it is run with the upgrade or as a standalone utility, maintains the status of the health in a log file.

The content of the log file is similar to the messages displayed on the screen when the checks are happening. For example, see [Figure B-1 on page 140](#) and [Figure B-2 on page 141](#).

The health check log file contains the following:

- ♦ Status of the health checks (normal, warning, or critical).
- ♦ URLs where possible solutions can be found.
 - ♦ [Support forums \(http://forums.novell.com/novell-product-support-forums/edir88tshoot/data/front.html\)](http://forums.novell.com/novell-product-support-forums/edir88tshoot/data/front.html)
 - ♦ [Troubleshooting Documentation \(http://www.novell.com/documentation/edir88tshoot/data/front.html\)](http://www.novell.com/documentation/edir88tshoot/data/front.html)

- ♦ [Error Codes \(http://www.novell.com/documentation/lg/nwec/index.html\)](http://www.novell.com/documentation/lg/nwec/index.html)
- ♦ [Patches \(http://support.novell.com/filefinder/5069/index.html\)](http://support.novell.com/filefinder/5069/index.html)
- ♦ [Cool Solutions \(http://www.novell.com/coolsolutions/nds/\)](http://www.novell.com/coolsolutions/nds/)

The following table gives the default log file location on various platforms:

Table B-2 *Health Check Log File Location*

Platform	Log Filename	Location
Linux and UNIX	ndscheck.log	<ol style="list-style-type: none"> 1. If you use the <code>-h</code> option, the <code>ndscheck.log</code> file is saved in the user's home directory. 2. If you use the <code>--config-file</code> option, the <code>ndscheck.log</code> file is saved in the server instance's log directory. You can also select an instance from the multiple instances list.
Windows	nsdcheck.log	The log file will be saved at <code>install_directory\novell\nds\</code> .
NOTE: <i>install_directory</i> is user specified.		

Configuring OpenSLP for eDirectory

C

This appendix provides information for network administrators on the proper configuration of OpenSLP for Novell eDirectory installations without the Novell Client.

- ♦ [Section C.1, “Service Location Protocol,” on page 143](#)
- ♦ [Section C.2, “SLP Fundamentals,” on page 143](#)
- ♦ [Section C.3, “Configuration Parameters,” on page 145](#)

C.1 Service Location Protocol

OpenSLP is an open-source implementation of the IETF Service Location Protocol Version 2.0 standard, which is documented in [IETF Request-For-Comments \(RFC\) 2608](http://www.ietf.org/rfc/rfc2608.txt?number=2608) (<http://www.ietf.org/rfc/rfc2608.txt?number=2608>).

In addition to implementing the SLP v2 protocol, the interface provided by OpenSLP source code is an implementation of another IETF standard for programmatically accessing SLP functionality, documented in [RFC 2614](http://www.ietf.org/rfc/rfc2614.txt?number=2614) (<http://www.ietf.org/rfc/rfc2614.txt?number=2614>).

To fully understand the workings of SLP, It is worth reading these documents and internalize them. They are not necessarily light reading, but they are essential to the proper configuration of SLP on an intranet.

For more information on the OpenSLP project, see the [OpenSLP](http://www.OpenSLP.org) (<http://www.OpenSLP.org>) Web site and the [SourceForge](http://sourceforge.net/projects/openslp) (<http://sourceforge.net/projects/openslp>) Web site. The OpenSLP Web site provides several documents that contain valuable configuration tips. Many of these are incomplete at the time of this writing.

C.2 SLP Fundamentals

Service Location Protocol specifies three components:

- ♦ The user agent (UA)
- ♦ The service agent (SA)
- ♦ The directory agent (DA)

The user agent’s job is to provide a programmatic interface for clients to query for services, and for services to advertise themselves. A user agent contacts a directory agent to query for registered services of a specified service class and within a specified scope.

The service agent’s job is to provide persistent storage and maintenance points for local services that have registered themselves with SLP. The service agent essentially maintains an in-memory database of registered local services. In fact, a service cannot register with SLP unless a local SA is present. Clients can discover services with only a UA library, but registration requires an SA, primarily because an SA must reassert the existence of registered services periodically in order to maintain the registration with listening directory agents.

The directory agent's job is to provide a long-term persistent cache for advertised services, and to provide a point of access for user agents to look up services. As a cache, the DA listens for SAs to advertise new services, and caches those notifications. Over a short time, a DA's cache will become more complete. Directory agents use an expiration algorithm to expire cache entries. When a directory agent comes up, it reads its cache from persistent storage (generally a hard drive), and then begins to expire entries according to the algorithm. When a new DA comes up, or when a cache has been deleted, the DA detects this condition and sends out a special notification to all listening SAs to dump their local databases so the DA can quickly build its cache.

In the absence of any directory agents, the UA will resort to a general multicast query that SAs can respond to, building a list of the requested services in much the same manner that DAs use to build their cache. The list of services returned by such a query is an incomplete and much more localized list than that provided by a DA, especially in the presence of multicast filtering, which is done by many network administrators, limiting broadcasts and multicasts to only the local subnet.

In summary, everything hinges on the directory agent that a user agent finds for a given scope.

C.2.1 Novell Service Location Providers

The Novell version of SLP takes certain liberties with the SLP standard in order to provide a more robust service advertising environment, but it does so at the expense of some scalability.

For example, in order to improve scalability for a service advertising framework, you can limit the number of packets that are broadcast or multicast on a subnet. The SLP specification manages this by imposing restrictions on service agents and user agents regarding directory agent queries. The first directory agent discovered that services the desired scope is the one that a service agent (and consequently, local user agents) will use for all future requests on that scope.

The Novell SLP implementation actually scans all of the directory agents it knows about looking for query information. It assumes a 300-millisecond round trip time is too long, so it can scan 10 servers in about 3 to 5 seconds. This doesn't need to be done if SLP is configured correctly on the network, and OpenSLP assumes the network is in fact configured correctly for SLP traffic. OpenSLP's response timeout values are greater than that of Novell's SLP service provider, and it limits the number of directory agents to the first one that responds, whether or not that agent's information is accurate and complete.

C.2.2 User Agents

A user agent takes the physical form of a static or dynamic library that is linked into an application. It allows the application to query for SLP services.

User agents follow an algorithm to obtain the address of a directory agent to which queries will be sent. Once they obtain a DA address for a specified scope, they continue to use that address for that scope until it no longer responds, at which time they obtain another DA address for that scope. User agents locate a directory agent address for a specified scope by:

1. Checking to see if the socket handle on the current request is connected to a DA for the specified scope. (If the request happens to be a multipart request, there may already be a cached connection present on the request.)
2. Checking its local known DA cache for a DA matching the specified scope.
3. Checking with the local SA for a DA with the specified scope (and adding new addresses to the cache).

4. Querying DHCP for network-configured DA addresses that match the specified scope (and adding new addresses to the cache).
5. Multicasting a DA discovery request on a well-known port (and adding new addresses to the cache).

The specified scope is “default” if not specified. That is, if no scope is statically defined in the SLP configuration file, and no scope is specified in the query, then the scope used is the word “default”. It should also be noted that eDirectory never specifies a scope in its registrations. That’s not to say the scope always used with eDirectory is “default.” In fact, if there is a statically configured scope, that scope becomes the default scope for all local UA requests and SA registrations in the absence of a specified scope.

C.2.3 Service Agents

Service agents take the physical form of a separate process on the host machine. In the case of Win32, slpd.exe runs as a service on the local machine. User agents query the local service agent by sending messages to the loop-back address on a well-known port.

A service agent locates and caches directory agents and their supported scope list by sending a DA discovery request directly to potential DA addresses by:

1. Checking all statically configured DA addresses (and adding new ones to the SA’s known DA cache).
2. Requesting a list of DA’s and scopes from DHCP (and adding new ones to the SA’s known DA cache).
3. Multicasting a DA discovery request on a well-known port (and adding new ones to the SA’s known DA cache).
4. Receiving DA advertising packets that are periodically broadcast by DAs (and adding new ones to the SA’s known DA cache).

Since a user agent always queries the local service agent first, this is important, as the local service agent’s response will determine whether or not the user agent continues to the next stage of discovery (in this case DHCP-- see steps 3 and 4 in [“User Agents” on page 144.](#)).

C.3 Configuration Parameters

Certain configuration parameters in the %systemroot%/slp.conf file control DA discovery as well:

```
net.slp.useScopes = <comma delimited scope list>
net.slp.DAAddresses = <comma delimited address list>
net.slp.passiveDADetection = <"true" or "false">
net.slp.activeDADetection = <"true" or "false">
net.slp.DAActiveDiscoveryInterval = <0, 1, or a number of seconds>
```

The useScopes option indicates which scopes the SA will advertise into, and which scopes queries will be made to in the absence of a specific scope on the registration or query made by the service or client application. Because eDirectory always advertises into and queries from the default scope, this list will become the default scope list for all eDirectory registrations and queries.

The `DAAddresses` option is a comma-delimited list of dotted decimal IP addresses of DAs that should be preferred to all others. If this list of configured DAs does not support the scope of a registration or query, then SAs and UAs will resort to multicast DA discovery, unless such discovery is disabled.

The `passiveDADetection` option is `True` by default. Directory agents will periodically broadcast their existence on the subnet on a well-known port if configured to do so. These packets are termed `DAAdvert` packets. If this option is set to `False`, all broadcast `DAAdvert` packets are ignored by the SA.

The `activeDADetection` option is also `True` by default. This allows the SA to periodically broadcast a request for all DAs to respond with a directed `DAAdvert` packet. A directed packet is not broadcast, but sent directly to the SA in response to these requests. If this option is set to `False`, no periodic DA discovery request is broadcast by the SA.

The `DAActiveDiscoveryInterval` option is a try-state parameter. The default value is 1, which is a special value meaning that the SA should only send out one DA discovery request upon initialization. Setting this option to 0 has the same effect as setting the `activeDADetection` option to “false.” Any other value is a number of seconds between discovery broadcasts.

These options, when used properly, can ensure an appropriate use of network bandwidth for service advertising. In fact, the default settings are designed to optimize scalability on an average network.

Documentation Updates

D

This section contains information about documentation content changes that were made in the *eDirectory 8.8 SP6 Installation Guide* after the initial release of eDirectory 8.8 release.

The documentation for this product is provided on the Web in two formats: HTML and PDF. The HTML and PDF documentation are both kept up-to-date with the changes listed in this section.

If you need to know whether a copy of the PDF documentation that you are using is the most recent, the PDF document includes a publication date on the title page.

In this section, content changes appear in reverse chronological order, according to the publication date. Within a dated entry, changes are grouped and sequenced, according to where they appear in the document itself. Each change entry provides a link to the related topic and a brief description of the change.

This document was updated on the following dates:

- ♦ [Section D.1, “October 15, 2010,” on page 147](#)
- ♦ [Section D.2, “August 19, 2010,” on page 147](#)
- ♦ [Section D.1, “October 15, 2010,” on page 147](#)
- ♦ [Section D.2, “August 19, 2010,” on page 147](#)

D.1 October 15, 2010

- ♦ Updated the system requirements sections in the chapters on all the platforms.
- ♦ Updated the correct version numbers.

D.2 August 19, 2010

Updates were made to the following section. The changes are explained below:

Location	Changes
Section 1.1, “System Requirements,” on page 9	Fixed Documentation comments.
Section 1.2, “Prerequisites,” on page 10	Added two requirements for installing or upgrading eDirectory. These additions fix the following defects: <ul style="list-style-type: none">♦ Defect #590087 (https://bugzilla.novell.com/show_bug.cgi?id=590087)♦ Defect #606264 (https://bugzilla.novell.com/show_bug.cgi?id=606264)
Section 1.5.3, “Unattended Upgrade of eDirectory on Unix,” on page 15	Added a new section.
Section 10.3, “Unattended Uninstallation of eDirectory on Unix,” on page 123	Added a new section.

Location	Changes
Chapter 11, "eDirectory Instrumentation," on page 125	Updated the section to reflect the changes made for eDirectory 8.8 SP6.
Entire book	<p>Removed the reference of NetWare for the following defect:</p> <p>Defect#627467 (https://bugzilla.novell.com/show_bug.cgi?id=627467)</p>