

Novell eDirectory™

8.6

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QUICK STARTS BOOKLET



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Novell eDirectory Overview

Novell® eDirectory™ is a highly scalable, high performing, secure directory service. It can store and manage millions of objects, such as users, applications, network devices, and data. Novell eDirectory natively supports the directory standard Lightweight Directory Access Protocol (LDAP) version 3 over Secure Socket Layer (SSL).

Novell eDirectory provides the basic foundation for the directory service, which provides replication and partitioning capabilities, along with other utilities. Additional packages that build upon this basic directory structure, such as DirXML and Account Management, are also available separately to increase functionality.

SUPPORTED PLATFORMS

- ☐ NetWare®
- ☐ Windows* NT*
- ☐ Windows 2000
- ☐ Solaris*
- ☐ Linux*

FOR MORE INFORMATION

For more information on Novell eDirectory, refer to the following sources:

- ♦ [Product information \(http://www.novell.com/products/nds\)](http://www.novell.com/products/nds)
- ♦ [Product support \(http://support.novell.com\)](http://support.novell.com)
- ♦ [Online forums \(news://forums.novell.com\)](news://forums.novell.com)
- ♦ [Product catalog \(http://www.novell.com/catalog\)](http://www.novell.com/catalog)
- ♦ [Product documentation \(http://www.novell.com/documentation\)](http://www.novell.com/documentation)

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Installing or Upgrading Novell eDirectory on NetWare

Use the following instructions to install or upgrade Novell® eDirectory™ on a NetWare® server.

Novell eDirectory for NetWare can co-exist with the following NDS or eDirectory versions:

- ♦ NetWare 4.11 or 4.2 with NDS 6.09 or later
- ♦ NetWare 5 with Support Pack 5 or later, and NDS 7.47 or later (but earlier than NDS 8)
- ♦ NetWare 5 with Support Pack 5 or later, and NDS 8.51 or later
- ♦ NetWare 5.1 with Support Pack 1 or later
- ♦ NDS eDirectory 8.5 on Windows* NT*, Windows 2000, NetWare, Solaris*, Linux*, or Tru64 UNIX*
- ♦ Novell eDirectory 8.6 on Windows* NT*, Windows 2000, NetWare, Solaris*, or Linux*

SYSTEM REQUIREMENTS

- ☐ If you are using RCONSOLE, a ConsoleOne™ administrator workstation with the following:
 - ♦ A 200 MHz or faster processor
 - ♦ A minimum of 64 MB RAM (128 MB recommended)
- ☐ The Novell® Client™ that shipped with NetWare 5 or later.
- ☐ The Novell Cryptography Support Modules (Novell International Cryptographic Infrastructure [NICI] 1.5.1 or later), available from the product CD or from the [Novell Cryptography Web site \(http://www.novell.com/products/cryptography\)](http://www.novell.com/products/cryptography).
- ☐ Administrative rights to the eDirectory tree so that you can modify the schema.

HARDWARE REQUIREMENTS

Hardware requirements depend on the specific implementation of eDirectory.

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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 8.6 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 eDirectory for NetWare:

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.

Of course, faster processors improve performance. Additional memory also improves performance because eDirectory can then cache more of the directory into memory.

FORCING THE BACKLINK PROCESS TO RUN

Because the internal eDirectory identifiers change when upgrading to Novell eDirectory, the backlink process has to 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 issuing a **SET DSTRACE=*B** command from the server console. Running the backlink process is especially important on servers that do not contain a replica.

INSTALLING NOVELL EDIRECTORY ON NETWORK

If your eDirectory tree does not have a Novell Certificate Server™, the eDirectory installation program does the following:

- Creates a Security container object for the entire eDirectory tree

This object is created at the top of the eDirectory tree and must remain there.

- Creates an Organizational Certificate Authority (CA) object
- Places the Organizational CA object in the Security container

Only one Organizational CA object can exist in an eDirectory tree. Because you must not move this object from one server to another, ensure that the first eDirectory server is the one that you intend to permanently host the Organizational CA object.

Prerequisites

If you are installing into a tree that has NetWare 5 servers, each NetWare 5.0 server must be running NetWare 5.0 Support Pack 5 or later. Each NetWare 5.1 server must be running NetWare 5.1 Support Pack 1 or later.

If you are upgrading eDirectory on a NetWare 5.1 server, the NetWare 5.1 server must be running NetWare 5.1 Support Pack 2a or later.

Updating the eDirectory Schema

To upgrade an existing NetWare 5.x server to eDirectory into an existing tree, update the eDirectory schema by running DSREPAIR on the server that has the master replica of the Tree partition.

IMPORTANT: If the master replica of the Tree partition resides on a Windows NT/2000 server, follow the instructions in ["Updating the eDirectory Schema" on page 19](#).

If one or both of the following conditions exist, you must run DSREPAIR.NLM before installing the first eDirectory server in your tree:

- Any NetWare 5 server in your eDirectory tree is eDirectory 8.
- Your first installation of eDirectory 8.6 is on a NetWare 5 server that does not hold a writable replica of the root partition.

To update the eDirectory schema:

- 1 Copy the appropriate DSREPAIR.NLM file from the product CD to the SYS:\SYSTEM directory of the server that contains the master replica of the Tree partition.

Table 1

For This Version of NetWare	With This Version of NDS	Copy
4.11 or 4.2	6.09 or later	PATCHES\DSREPAIR\NW4X\DSREPAIR.NLM
5.0 or later	NDS 7 version 7.47 or later	PATCHES\DSREPAIR\NW5X\DSREPAIR.NLM
5.0 or later	8.11 or 8.17	Not supported
5.0 or later	8.51 or later	PATCHES\DSREPAIR\NWNS8\DSREPAIR. NLM

- 2 At the server console of the master replica of the Tree partition, load DSREPAIR.NLM.
- 3 Select Advanced Options Menu > Global Schema Operations.
- 4 Enter the Administrator's name (for example, .Admin.VMP) and password.
- 5 Select Post NetWare 5 Schema Update > Yes.

DSREPAIR.NLM updates the schema and posts the results to the DSREPAIR.LOG file.

Ignore errors associated with adding object classes. DSREPAIR.NLM is simply applying the Post NetWare 5 Schema Update changes to each object.

- 6 Copy the appropriate patch version of DSREPAIR.NLM to each NetWare server in the eDirectory tree.

Use **Table 1** as a reference. Having a correct version on each server ensures that the schema needed for eDirectory is properly maintained when DSREPAIR.NLM is run in the future.

If you use an earlier version of DSREPAIR.NLM and select Rebuild Operational Schema, schema enhancements made by the Post NetWare 5 Schema Update will be lost. To resolve lost schema enhancements, run DSREPAIR.NLM according to the following table.

If you are running DSREPAIR.NLM from here	Do this
A server that holds a writable replica of the root partition	Reapply the Post NetWare 5 Schema Update to your eDirectory tree.
From any other server	Click Advanced Options > Global Schema Operations > Request Schema from Tree.

This action resynchronizes the schema from the root of the tree.

- 7 Close DSREPAIR.NLM before installing eDirectory on the server.

If DSREPAIR.NLM is loaded, the server might not restart.

Installing a Support Pack

Table 2

Before installing eDirectory on this server	Install this support pack
NetWare 5	NetWare 5 Support Pack 6a
NetWare 5.1	NetWare 5.1 Support Pack 2a or later

- 1 (Conditional) Download the latest support pack to the NetWare 5.x server.

For example, download to SYS:\.

If you purchased a support pack CD from Support Connection, skip this step.

- 2 (Conditional) Expand the support pack.

For NW51SP1.EXE, the support pack might take several minutes to verify an ARJ-SECURITY envelope. After verification, the support pack creates an NW5SPX directory and places subdirectories and files there.

If you purchased a CD from Support Connection, skip this step. The support pack is already expanded.

- 3 At the server console, start NWCONFIG.NLM.

- 4 Select Product Options > Install a Product Not Listed.

- 5 Press F3 (F4 if you're using RCONSOLE) > specify the path to the expanded Support Pack files, such as SYS:\NW5SP4.

- 6 Select options.

Follow the online instructions to install the support pack.

During installation, the support pack might prompt you concerning extending the schema. Although you have already extended the schema for eDirectory, you most likely need to extend the schema for other functionality, such as Novell Licensing Services.

- 7 Take the server down, then restart it.

If you checked the Reboot Server option in Step 6, the server automatically restarts.

Installing eDirectory

1 (Conditional) If you are upgrading eDirectory, do the following:

- 1a** In the AUTOEXEC.NCF file, comment out the lines that load virus scanners, database applications such as Sybase* or Oracle*, backup applications, and other programs that rely on files being continually open and volumes being mounted.

During the eDirectory installation, the software must dismount volumes so that trustee assignments can be migrated.

Be aware that virus scanners and other programs might be embedded inside other products, for example, ZENworks™, ManageWise™, and BorderManager™.

- 1b** Restart the server and verify that the programs and applications referred to in **Step 1a** are not running.

HINT: If you uncompress the volume you are installing eDirectory on, the install will finish quicker.

2 (Conditional) If you have an IP-only environment, load IPXSPX.NLM.

NWCONFIG.NLM looks to Btrieve* for the product list. Btrieve subsequently requires IPX™. Loading IPXSPX.NLM allows Btrieve to load. When you reboot the server, IPXSPX.NLM does not reload, so you have an IP-only environment again.

3 At the server console, load NWCONFIG.NLM.

4 Select Product Options > Install a Product Not Listed.

5 Press F3 (F4 if you're using RCONSOLE) > enter the path to the eDirectory files under the NW directory, for example, SYS:\NW.

Follow on screen prompts concerning license agreements, the readme file, and tips.

After files are copied, the server automatically restarts and begins to install components for ConsoleOne and Novell Certificate Server.

6 Enter the administrator's login name (for example, Admin.VMP).

IMPORTANT: This window might close before you enter this information. If it does, toggle (Alt+Esc) to the screen and enter the information. Otherwise, the installation will not be complete.

7 Follow the online instructions concerning the Certificate Server, LDAP, languages, components, and products to install.

8 When the installation is completed, restore the lines that you commented out in **Step 1a on **page 14** > restart the server by clicking Yes.**

Repeat this procedure for each NetWare server you want to upgrade to eDirectory for NetWare.

Lost Trustee Assignments on NFS Gateway Volumes

The eDirectory installation process does not upgrade trustee assignments on NFS Gateway

volumes. If you are hosting NFS Gateway volumes on a server upgraded to eDirectory, those trustee assignments are mapped to non-existent trustees.

To delete the inaccurate trustee assignments, complete the following steps:

- 1 On the server, load UNICON > authenticate to eDirectory.
- 2 Select Start/Stop Services > NFS Gateway Server > Del.
- 3 From a workstation, log in to the server > delete the file SYS:\NFSGW\SFSxxx.DAT.
- 4 At the server, load UNICON again > authenticate to eDirectory.
- 5 Select Start/Stop Services > NFS Gateway Server.

You will need to manually create new trustee assignments for eDirectory objects to any NFS Gateway volumes.

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Installing or Upgrading Novell eDirectory on Windows NT/2000

Use the following instructions to install or upgrade Novell® eDirectory™ on a Windows* NT* or Windows 2000 server.

SYSTEM REQUIREMENTS

- ☐ A Windows NT server 4.0 with Service Pack 4 or later (or Windows 2000 Server) and an assigned IP address.
- ☐ A Pentium* 200 with a minimum of 64 MB RAM (128 MB recommended) and a monitor color palette set to a number higher than 16.
- ☐ (Optional) One or more workstations running one of the following:
 - ♦ Novell® Client™ for Windows 95/98 3.0 or later
 - ♦ Novell Client for Windows NT 4.5 or later
 - ♦ NT client
- ☐ Administrative rights to the NT/2000 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.

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.

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eDirectory scales well on a single processor. However, Novell eDirectory 8.6 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 NT and Windows 2000:

Objects	Processor	Memory	Hard Disk
10,000	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.

FORCING THE BACKLINK PROCESS TO RUN

Because the internal eDirectory identifiers change when upgrading to eDirectory, the backlink process has to 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 issuing a **SET DSTRACE=*B** command from the server console. Running the backlink process is especially important on servers that do not contain a replica.

INSTALLING NOVELL EDIRECTORY ON WINDOWS NT/2000

Novell eDirectory 8.6 for NT upgrades NT servers running NT Service Pack 4 or later and

eDirectory 8.35 or later.

If no eDirectory tree exists, you can install eDirectory 8.6. The installation program creates an eDirectory tree.

If your eDirectory tree does not have a Novell Certificate Server, the eDirectory installation program does the following:

- ♦ Creates a Security container object for the entire eDirectory tree
- ♦ Creates an Organizational Certificate Authority (CA) object
- ♦ Places the Organizational CA object in the Security container

Only one Organizational CA object can exist in an eDirectory tree. Because you must not move this object from one server to another, ensure that the first eDirectory server is the one that you intend to permanently host the Organizational CA object.

Prerequisites

- ❑ Because NTFS provides a safer transaction process than a FAT file system provides, you can only install eDirectory on an NTFS partition. Therefore, if you only have FAT file systems, do one of the following:

- ♦ Create a new partition and format it as NTFS.

Use Disk Administrator. Refer to *Windows NT Server User Guide* for more information.

- ♦ Convert an existing FAT file system to NTFS, using the CONVERT command.

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.

- ❑ If you are installing eDirectory for NT/2000 into an eDirectory tree that has NetWare and NT/2000 servers, each NetWare server must be running one of the following:

- ♦ NetWare 4.2 with NDS 6.09 or later
- ♦ NetWare 5.0 with Support Pack 5 or later
- ♦ NetWare 5.1 with Support Pack 1 or later
- ♦ NetWare 6

Each NT/2000 server must be running eDirectory 8.0 or later.

Updating the eDirectory Schema

To upgrade an existing tree, run DSREPAIR on the server that contains the master replica of the Tree partition.

IMPORTANT: If the master replica of the Tree partition resides on a NetWare server, follow the instructions in **"Updating the eDirectory Schema" on page 11.**

The eDirectory installation program checks the existing schema's version. If the schema has not been upgraded, the installation program instructs you to run DSREPAIR, then discontinues.

- 1 Copy PATCHES\DSREPAIR\ NTNDS8\DSREPAIR. DLL from the product CD to the directory where you installed eDirectory, for example, G:\NOVELL\NDS.

This file is version 8.35.

- 2 Start NDSCONSOLE by running NDSCONS.EXE.

This file is in the directory where you installed eDirectory.

- 3 Select DSREPAIR from the NDS Service list.

- 4 Enter **-ins** in the Startup Parameters field > click Start.

After the schema has been updated, the status field next to the DSREPAIR module in NDSCONSOLE will be blank.

- 5 To see the results of the schema update, select DSREPAIR in NDSCONSOLE.

- 6 Click Start > File > Open Log File > Open.

The last entry of the log file will contain the results of the schema update.

Installing eDirectory

- 1 At the NT/2000 server, log in as Administrator or as a user with administrative privileges.

- 2 Run SETUP.EXE from the NT directory on the product CD.

- 3 Select which components to install.

You can install the components separately or together.

- Install Novell Directory Services

This option installs eDirectory in an NT/2000-only or mixed NetWare/NT/2000 server environment.

Follow the online instructions in the Installation Wizard.

- SLP Directory Agent

Installs SLP Directory Agent, which allows you to control the collection and dissemination of network service information through advanced features.

Follow the online instructions in the Installation Wizard. Select the type of setup you want to install:

Directory: Use eDirectory to manage, configure, and store Directory Agents, scopes, and services.

Local: The Directory Agent and its associated scopes and services are stored and configured through the local machine.

- ♦ Install ConsoleOne

This option installs ConsoleOne™ 1.3.

Follow the online instructions in the Installation Wizard.

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

- ♦ Novell Client for Windows NT/2000

For more information on the Novell Client for Windows NT, see the [Novell Client for Windows online documentation \(http://www.novell.com/documentation/lg/client/docui/index.html\)](http://www.novell.com/documentation/lg/client/docui/index.html).

- ♦ Novell licensing

You can obtain an evaluation license file from http://www.novell.com/products/nds/licenses/eval_85.html.

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Installing Novell eDirectory on Solaris

Use the following instructions to install Novell® eDirectory™ on Solaris*.

SYSTEM REQUIREMENTS

- ❑ Solaris 2.6 (with patch 105591-07 or later), Solaris 7 (with patch 106327-06 or later for 32-bit systems), Solaris 7 (with patch 106300-07 or later for 64-bit systems), or Solaris 8.

All recommended Solaris OS patches are available at the [SunSolve* Online Web page \(http://sunsolve.sun.com\)](http://sunsolve.sun.com).

- ❑ A minimum of 64 MB RAM (128 MB recommended)
- ❑ 56 MB of disk space to install the eDirectory Server.

Additional disk space requirements will depend on the number of objects you will have in eDirectory.

- ❑ ConsoleOne requirements:

- ♦ ConsoleOne 1.3
- ♦ 32 MB disk space

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.

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Instructions for International. For SINGLE cards: 1. After importing SGML, click the BookQS element in the "Structure View" window. 2. Select QuickStart in the "Elements" window and click Wrap. 3. Right-click the BookQS element in the "Structure View" to bring up menu, and select Unwrap. 4. Highlight the Front element in the "Structure View" and delete it. 5. Right-click the nested QuickStart element in the "Structure View" to bring up menu, and select Unwrap. 6. You can continue with print prep and creating PostScript and PDF, even though the file is not completely valid because the ID on the QuickStart element is missing. That's okay—it will not affect the appearance of the document, so PostScript and PDF will be correct. For cards in a booklet: To remove part number from first page, use the master page "First."

eDirectory scales well on a single processor. However, eDirectory 8.6 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.

FORCING THE BACKLINK PROCESS TO RUN

Because the internal eDirectory identifiers change when upgrading to Novell eDirectory, the backlink process has to 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 issuing a `SET DSTRACE=*B` command from the `ndstrace` command prompt. Running the backlink process is especially important on servers that do not contain a replica.

PREREQUISITES

eDirectory Server must be installed on all servers that you want to place an eDirectory replica on.

- ☐ Meet the "System Requirements" on page 23.
- ☐ Enable the Solaris host you are installing the product on for multicast routing. Enter the

following command to check whether the host is enabled for multicast routing:

```
/usr/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 secure Novell eDirectory operations, you will need the NCI Foundation Key file. You can obtain an evaluation license file from http://www.novell.com/products/nds/licenses/eval_85.html. If you do not use the NCI Foundation Key, you will not be able to create Certificate Authority and Key Material objects.
- ☐ If you have more than one server in the tree, the time on all the network servers should be synchronized. Use Network Time Protocol (NTP) to synchronize time. If you want to synchronize time on Linux, or Solaris systems with NetWare servers, use TIMESYNC.NLM 5.09 or later.
- ☐ 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.
- ☐ For the first eDirectory installation, the administrator needs Write rights to the Tree partition to update the schema.

INSTALLING EDIRECTORY ON SOLARIS

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.

To install eDirectory components on Solaris systems:

- 1 Log in as root on the host.
- 2 Enter the following command:

```
nds-install
```

- 3 When prompted, accept the license agreement.

The installation program displays a list of Novell eDirectory components that you can install.

- 4 Specify the option for the component you want to install.

Based on the component you choose to install, the installation program proceeds to add the appropriate packages into the Solaris system. [Table 3](#) lists the packages installed for each eDirectory component.

Table 3

eDirectory Component	Packages Installed	Description
eDirectory Server	NDSbase, NDScommon, NDSsecur, NDSsecutl, NDSmasv, NDSserv, NDSimon, NDSrepair, and NDSslp	The eDirectory replica server will be installed on the specified server
Administration Utilities	NDSadmutl, NDSsecutl, NDSbase, and NLDAPbase	The administration utilities ICE and LDAP Tools will be installed on the specified workstation
Management Console for eDirectory	NDSbase, NDSslp, NovLC1, C1JRE, and NDS set of packages	The management console for eDirectory will be installed on the specified workstation
NMAS (Novell Modular Authentication Service) server	NDSnmas	The NMAS server components and the configuration utilities will be installed on the specified server.

5 If you are prompted, enter the complete path to the NICI Foundation Key file.

You will be prompted to enter the complete path to the NICI Foundation Key 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. However, to do so, you need to ensure that the .nfk file has been copied to the /var directory.

If you have selected Novell Modular Authentication Service (NMAS) as one of the component to be installed, you can use nmasconfig utility to configure NMAS server after installation. This must be done after completing the eDirectory configuration using the ndsconfig utility.

For more information on the nmasconfig utility, refer to the nmasconfig manpage, *nmasconfig.1m*.

IMPORTANT: Before you begin to use Novell eDirectory, you must ensure that SLP has been installed properly in order for the eDirectory tree to be advertised correctly. To determine if the eDirectory tree is advertised, type the following:

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

To begin a QuickStart (English): Click in the box under the word Novell. Insert QuickStart and Title elements. 2. Type the product name. 3. Insert the HeadQS element and type the title of your card. 4. Put in your product version: Click Special > Variable > select the variable named Version > Edit Definition > enter the version number > click Done > Done. It will appear as background text replacing Version X.X.

For a single (stand-alone) card: Keep this master page, named "QS-Single." It shows the part number on the bottom right, since single cards don't have front matter.

For a card that's part of a booklet: Use Special > Master Page Usage to change to using "First" master page on the first page of the card. It doesn't show the part number, since part number will be noted in the front of the booklet.

Novell eDirectory

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QUICKSTART

Installing Novell eDirectory on Linux

Use the following instructions to install Novell® eDirectory™ on Linux*.

SYSTEM REQUIREMENTS

- ☐ Linux 2.2 and glibc 2.1.3.
- ☐ A minimum of 64 MB RAM (128 MB recommended)
- ☐ 56 MB of disk space to install the eDirectory server.

Additional disk space requirements will depend on the number of objects you will have in eDirectory.

- ☐ ConsoleOne requirements:
 - ♦ ConsoleOne 1.3
 - ♦ A minimum of 64 MB RAM (128 MB recommended)
 - ♦ 200 MHz processor (a faster one is recommended)
 - ♦ 32 MB disk space

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.

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Instructions for International. For SINGLE cards: 1. After importing SGML, click the BookQS element in the "Structure View" window. 2. Select QuickStart in the "Elements" window and click Wrap. 3. Right-click the BookQS element in the "Structure View" to bring up menu, and select Unwrap. 4. Highlight the Front element in the "Structure View" and delete it. 5. Right-click the nested QuickStart element in the "Structure View" to bring up menu, and select Unwrap. 6. You can continue with print prep and creating PostScript and PDF, even though the file is not completely valid because the ID on the QuickStart element is missing. That's okay—it will not affect the appearance of the document, so PostScript and PDF will be correct. For cards in a booklet: To remove part number from first page, use the master page "First."

eDirectory scales well on a single processor. However, eDirectory 8.6 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 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.

FORCING THE BACKLINK PROCESS TO RUN

Because the internal eDirectory identifiers change when upgrading to Novell eDirectory 8.6, the backlink process has to 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 8.6, we recommend that you force the backlink to run by issuing a **SET DSTRACE=*B** command from the ndstrace command prompt. Running the backlink process is especially important on servers that do not contain a replica.

PREREQUISITES

eDirectory Server must be installed on all servers that you want to place an eDirectory replica on.

- ☐ Meet the "System Requirements" on page 27.

- ❑ Enable the Linux host you are installing the product on for multicast routing. Enter the following command to check whether the host is enabled for multicast routing:

```
/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 device
```

- ❑ For secure Novell eDirectory operations, you will need the NCI Foundation Key file. You can obtain an evaluation license file from http://www.novell.com/products/nds/licenses/eval_85.html. If you do not use the NCI Foundation Key, you will not be able to create Certificate Authority and Key Material objects.
- ❑ If you have more than one server in the tree, the time on all the network servers should be synchronized. Use Network Time Protocol (NTP) to synchronize time. If you want to synchronize time on Linux or Solaris systems with NetWare servers, use TIMESYNC.NLM 5.09 or later.
- ❑ 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.
- ❑ For the first eDirectory installation on Linux, the administrator needs Write rights to the Tree partition to update the schema.

INSTALLING EDIRECTORY ON LINUX

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

To install eDirectory components on Linux systems:

- 1 Log in as root on the host.

- 2 Enter the following command:

```
nds-install
```

- 3 When prompted, accept the license agreement.

The installation program displays a list of eDirectory components that you can install.

- 4 Specify the option for the component you want to install.

Based on the component you choose to install, the installation program proceeds to add the appropriate RPMs in to the Linux system. **Table 4** lists the RPMs installed for each eDirectory component.

Table 4

eDirectory Component	Packages Installed	Description
eDirectory Server	NDSbase, NDScommon, NDSsecur, NDSsecutl, NDSmasv, NDSserv, NDSimon, NDSrepair, and NDSslp	The eDirectory replica server will be installed on the specified server
Administration Utilities	NDSadmutl, NDSsecutl, NDSbase and NLDAPbase	The administration utilities ICE and LDAP Tools will be installed on the specified workstation
Management Console for eDirectory	NDSbase, NDSslp, NovLC1, C1JRE, and NDS set of packages	The management console for eDirectory will be installed on the specified workstation
NMAS (Novell Modular Authentication Service) server	NDSnmas	The NMAS server components and the configuration utilities will be installed on the specified server.

5 If you are prompted, enter the complete path to the NICI Foundation Key file.

You will be prompted to enter the complete path to the NICI Foundation Key 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. However, to do so, you need to ensure that the .nfk file has been copied to the /var directory.

If you have selected Novell Modular Authentication Service (NMAS) as one of the component to be installed, you can use nmasconfig utility to configure NMAS server after installation. This must be done after completing the eDirectory configuration using the ndsconfig utility.

For more information on the nmasconfig utility, refer to the nmasconfig manpage, *nmasconfig.1m*.

IMPORTANT: Before you begin to use eDirectory, you must ensure that SLP has been installed properly in order for the eDirectory tree to be advertised correctly. To determine if the eDirectory tree is advertised, type the following:

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