

Licensing Services Administration guide

Novell® Open Enterprise Server

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About This Guide

This guide describes how to install, configure, and monitor licensing using Novell® Licensing and Metering Services and is divided into the following sections:

- ♦ Chapter 1, “Overview,” on page 11
- ♦ Chapter 2, “Managing Licensing and Certificates,” on page 19
- ♦ Chapter 4, “Metering Network and Product Usage,” on page 33
- ♦ Chapter 5, “Troubleshooting Novell Licensing Services,” on page 35
- ♦ Appendix 6, “Key NLS Terms,” on page 39

IMPORTANT: OES NetWare and NetWare 6.5 share the same code base and are the same in every way. Installing the OES NetWare product or associated support pack is the same as installing the simultaneously released NetWare 6.5 product or associated support pack.

Audience

This guide is intended for anyone involved in installing, managing, and using Novell Licensing Services.

Feedback

We want to hear your comments and suggestions about this manual and 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 Licensing Administration Guide*, see the [OES NetWare Documentation Web Site \(http://www.novell.com/documentation/oes\)](http://www.novell.com/documentation/oes).

Documentation Conventions

In this documentation, a greater-than symbol (>) is used to separate actions within a step and items within a cross-reference path.

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When a single pathname can be written with a backslash for some platforms or a forward slash for other platforms, the pathname is presented with a backslash. Users of platforms that require a forward slash, such as Linux* or UNIX*, should use forward slashes as required by your software.

Novell® Licensing Services (NLS) software is installed with every NetWare® server, allowing you to install and manage license certificates in your eDirectory™ tree and monitor NetWare usage. You can also monitor usage of Novell Licensing Services-enabled products.

The overview will help you understand Novell's User Access Licensing Model and how Novell licensing works.

- ♦ [Section 1.1, "OES NetWare Includes MLA License Files," on page 11](#)
- ♦ [Section 1.2, "Understanding User Access Licensing," on page 13](#)
- ♦ [Section 1.3, "How Novell Licensing Services Works," on page 15](#)
- ♦ [Section 1.4, "What's Next," on page 18](#)

1.1 OES NetWare Includes MLA License Files

Beginning with OES 1 NetWare® (NetWare 6.5 SP4), both the user licenses and the standard server license files were replaced by a Master License Agreement (MLA) license file that is included in a \LICENSE folder at the root of the installation media.

MLA licenses contain a special server license and no user licenses. MLA licenses

- ♦ Permit NLS to grant logins without user licenses.
- ♦ Provide for auditing of user connections for *paper license* compliance.

1.1.1 User Access Licensing Is Still in Force

Novell licenses OES NetWare using the same User Access Licensing model that was initiated with the release of NetWare 6. You must still purchase paper licenses to cover the number of users connected to your network, but managing license certificates in eDirectory is greatly simplified. For example, installing a single MLA license at the top of your eDirectory tree (Organization layer) lets you

- ♦ License all the NetWare servers in your tree.
- ♦ Audit user connections to help ensure compliance with your OES license agreement.

1.1.2 An Installed License Is Still Required

Although user licenses are no longer required, an unlicensed installation still allows only two user connections. You must install the MLA license in eDirectory to have more than two users connected to your network.

1.1.3 Having an MLA License Does Not Equal Having a Master Licensing Agreement with Novell

Having an MLA license installed as part of an OES purchase does not constitute having a Master License Agreement contract with Novell that allows for unlimited user connections. Unless you actually have an MLA contract with Novell, you are using Red Box™ licensing, and the number of user connections you can legally allow is specified in one or more paper licenses issued with your OES purchases.

1.1.4 OES 1 Vs. OES 2

The distribution of MLA licenses from Novell is different for OES 1 and OES 2.

OES 1: The NetWare installation media includes a 90-day evaluation MLA license at the root of the NetWare installation media. When you purchase the product, you receive a non-expiring MLA license. You must uninstall the evaluation license and install the non-expiring MLA license in its place. For instructions, see [Section 2.5, “Installing and Removing License Certificates,” on page 21](#).

The number of user connections that are legally allowed on your network is specified in the paper license agreements that Novell issues with each OES 1 purchase.

OES 2: The NetWare installation media includes a non-expiring MLA license at the root of the NetWare installation media. Demo or evaluation licenses are no longer issued. However, you are authorized to evaluate NetWare for up to 90 days while deciding whether to purchase OES 2. If you decide not to purchase OES 2, Novell expects you to uninstall NetWare. If you purchase OES 2, no further installation of license certificates is required.

The number of user connections that are legally allowed on your network is specified in the paper license agreements that Novell issues with each OES 2 purchase.

1.1.5 Auditing for Compliance

As mentioned above, the licensing model for OES NetWare is basically unchanged from NetWare 6. You are under the same obligations to ensure your organization complies with your license agreements with Novell.

After installing MLA licenses, you should use the NetWare Usage tool to ensure you are in compliance with your paper license agreement. See [Chapter 4, “Metering Network and Product Usage,” on page 33](#) for more information.

1.1.6 Using the Information in This Guide

Because this guide deals with multiple versions of NetWare and must also cover information pertinent to other products that use NLS, the OES changes mentioned in this section are not necessarily reflected in all discussions throughout the guide. For example, user licenses are still discussed, even though they are not issued with OES.

As you use the information in the guide, keep in mind that the licensing model established with NetWare 6 remains in force in OES NetWare. The biggest changes are that license certificate management in eDirectory is much simpler now, and that user licenses are no longer issued by Novell, nor are they required by the current versions of NetWare.

1.2 Understanding User Access Licensing

Managing network licenses has always been a challenge for network administrators. Each year, administrators prepare their software budgets by trying to determine the number of network and application licenses required. This task is often frustrating because of the complexity of software licensing. After administrators complete their budgets, they often find their budgets are inadequate because of changes in their company. In response to customer requests, Novell has changed its licensing model and made enhancements to its licensing utilities to simplify licensing management tasks.

Beginning with NetWare 6, NetWare uses a User Access License (UAL) model. With this model, you purchase licenses for the total number of eDirectory User objects that will log in to the network. When a User object logs in to the network, it obtains a license unit that allows them to access network services at any time, from any workstation. That license unit is reserved for that user. Users can access as many NetWare servers as they need while consuming only one license. If the user does not log in for more than 90 days, then the license is automatically released and made available to the next user that needs it.

In the User Access Model, non-User objects like Printers and ZENworks® do not consume user licenses.

1.2.1 Comparing Licensing Models

In previous licensing implementations, users were granted access to network services on a server basis. This meant users consumed a license on each server that they logged in to. This is known as the Server Connection License (SCL) model. Earlier versions of NetWare (NetWare 5 and earlier) used the SCL model, where you purchased licenses for the total concurrent users on each NetWare server.

The Server Connection License model had drawbacks. It was difficult to plan and deploy, customers had to pay for multiple connections for the same person, and there was no easy way to count and audit licenses.

The following table shows the differences between the Server Connection Licensing Model and the User Access Licensing model.

Table 1-1 *Licensing Model Comparison*

Feature	User Access Licensing Model	Server Connection Licensing Model
License packaging	Server and user license certificates available together or separately.	Server and user license contained in same license envelope.
Search	Search starts at the user's context and goes up the tree.	Search starts at the server's context and goes up the tree.
Context of licenses	Install license certificates relative to users' contexts.	Install license certificates relative to servers' contexts.
License released when user logs out	No.	Yes.

Feature	User Access Licensing Model	Server Connection Licensing Model
Connection-oriented objects (like Printer and ZENworks objects) consume a user or connection license	No.	Yes, until the current Support Pack is installed. To download a Support Pack, see Novell Support (http://support.novell.com) .

The User Access Licensing Model is easier to plan and deploy because you just count the number of eDirectory User objects, customers pay for only one user license, and network usage can be monitored.

1.2.2 Using Access Licensing with Server Connection Licensing

User Access Licensing can coexist on a network with servers that are using Server Connection licenses. Depending on the resources being accessed, a user might consume a User Access License and a Server Connection License simultaneously.

For example, a company has six NetWare 5.1 servers, each with a 50-user license. The company has 50 network users. The company upgrades four of the six servers to OES NetWare. When a user logs in to the network, he will consume one User Access License Unit, which will let him log in to any number of NetWare 6 or later servers. For each NetWare 5 server he logs in to, he will also consume a NetWare 5.1 Server Connection License unit, the same as he always has.

In order for all 50 users to log in to the four NetWare servers, the administrator has to purchase just 50 user licenses.

1.2.3 Monitoring Network Usage

Since managing network usage is now a network administrator's priority, Novell has released a metering tool that lets you see the total number of licenses being consumed and when a user last accessed the network. See [“Metering Network and Product Usage” on page 33](#) for more information.

1.2.4 Understanding Server and User Licenses

The User Access Licensing model uses server licenses and user licenses. These licenses are separate and distinct files.

Using Server Licenses

During the NetWare server installation, you install a server license. Each server in the tree should have a server license associated with it. The server licenses should be installed at or above the eDirectory container where the Server object resides. One server license can license up to unlimited NetWare servers in the same container or subcontainers. The same server license can be installed multiple times in the same eDirectory tree, but only once in a container.

The server license determines the type of user licenses to be consumed. For example, if you install a NetWare Demo server license, NLS will look for NetWare Demo user licenses to be consumed. If a NetWare Demo user license is not found, users will not be allowed access.

This is important to understand when changing licenses. For example, if you install NetWare Demo licenses (both server and user) and later change to a volume licensing agreement like MLA, you need to install the server and user licenses for the MLA and then delete the demo license for both the server and user.

For more information, see [Section 2.4, “Guidelines for Installing License Certificates,” on page 21](#).

Using User Licenses

User licenses are not assigned to servers. They are installed in the eDirectory tree in the same container as or in a container above the User objects that will consume the licenses. You must have enough user licenses for each user that will authenticate to eDirectory. For more information, see [Section 2.4, “Guidelines for Installing License Certificates,” on page 21](#).

Starting with OES NetWare, user licenses are no longer issued by Novell. The maximum user connections allowed are specified in a paper license agreement with Novell.

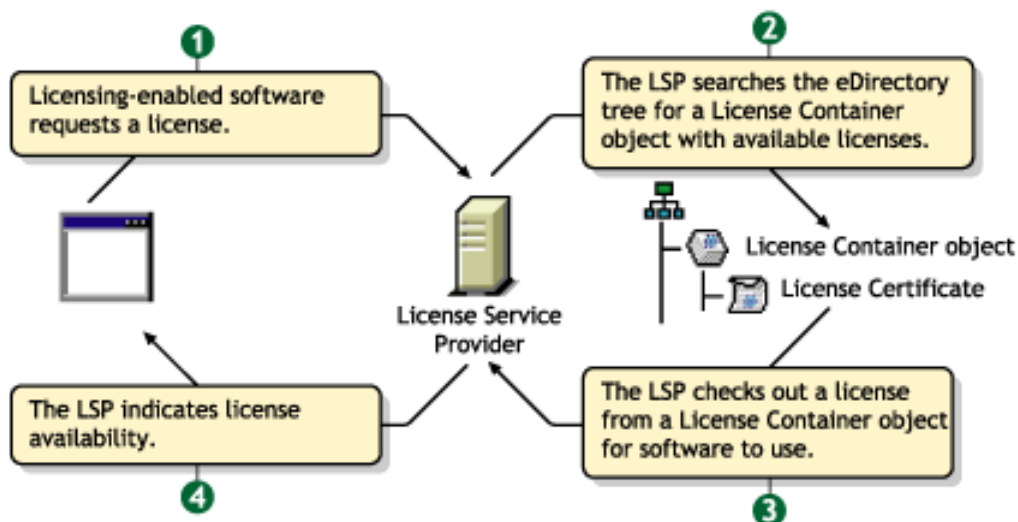
1.3 How Novell Licensing Services Works

Novell Licensing Services is comprised of the following components:

- ♦ **NLS Clients** requests licensing services from license service providers.
- ♦ **License Service Provider** is software that you install and run on NetWare servers.
- ♦ **Nlsrup.nlm** gathers network usage information
- ♦ **Novell Remote Manager** lets you view version information about Novell Licensing Services.
- ♦ **Novell iManager** lets you install and manage license certificates in an eDirectory tree and monitor NetWare usage.

1.3.1 How Novell Licensing Services Interacts with eDirectory

Figure 1-1 How NLS Works



Corresponding with the above figure, the following sequence outlines how license service providers handle requests from NLS clients by interacting with the eDirectory database.

1. An application issues a request to the NLS client.

In NetWare, for example, the server requests a license unit on behalf of the user that is connecting to the server. The server issues this request to the NLS client.

2. The NLS client library packages the request from the application and submits it to a license service provider.

In NetWare, for example, the NLS client communicates with the license service provider on that server.

3. The license service provider examines the request and determines whether it can fill the request. It does this by checking the eDirectory context of the requesting client for the specific information or license unit being requested.

In NetWare, for example, the license service provider searches the user's context for a NetWare license unit.

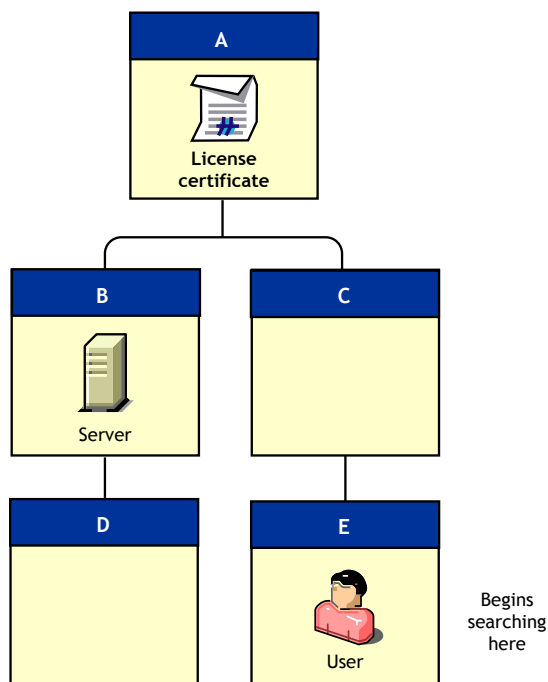
4. If the requested resource is available, the license service provider fills the request. If the license service provider cannot fill the request, it searches for a resource. Where an license service provider starts its search for a resource depends on what the requesting application has specified.

The license service provider can check the next-higher context in eDirectory for the requested resources. The license service provider continues to search until it reaches the [Root] or Tree of the partition or the top of the tree, depending on how the license service provider is configured.

In NetWare, for example, the license service provider starts in the user's context and searches up the eDirectory tree for a user license.

The following figure illustrates how an license service provider searches for a license certificate in the User Access Licensing model.

Figure 1-2 How the license service provider searches for a license



In this example, the user accesses the network from context .E.C.A. To search for a license unit, the license service provider begins its search in the user's context—.E.C.A The license service provider searches up the tree to context A and finds an available license unit.

5. The license service provider returns status to the client library.

In NetWare, for example, if the license service provider finds a NetWare license unit, it returns a successful status to the library. Otherwise, it returns an error code.

6. The library returns status to the application.

In NetWare, for example, the library returns licensing status to the server.

7. The application determines action based upon the status of license units.

In NetWare, for example, the server determines an action. If the status is successful, the server allows a connection to the server. Otherwise, the server allows a grace connection if one is available, or denies service if a grace connection isn't available. Up to 3 grace connections are allowed.

1.3.2 Example of NLS Client Software on a Client Workstation

At your Windows^{*} 2000 workstation you want to use OptionsPlus, an NLS-enabled application. After you click the icon for OptionsPlus, that application loads on your client workstation.

OptionsPlus then requests a license unit. The NLS component (a .dll file linked to OptionsPlus software) locates a license service provider (an NLS component running on a server). That license service provider searches eDirectory for a License Certificate object that has license units available.

The license service provider responds to the NLS client in OptionsPlus and allows you to use the application.

1.3.3 Example of NLS Client Software on a Server

When starting a server, NetWare loads and runs eDirectory and a license service provider, two necessary components of the NLS system.

Before completing its booting up, NetWare's policy manager uses NLS client software (an NLM™ library for NLS) to request a server base license from the license service provider.

The license service provider then queries eDirectory for a license certificate. If a license unit is available, the license service provider then grants the request for the policy manager, and the NetWare server is allowed to run.

NLS itself does not enforce licensing. Instead, it checks out a license unit or returns the appropriate error condition to the application. The policy manager part of the application then determines whether the user can use the application and how the error condition is reported.

1.3.4 Example of Metering

A client workstation requests an application that is not NLS-enabled. ZENworks, integrated with NLS, requests a license unit on behalf of the application.

Depending on the response from NLS, Application Launcher in ZENworks chooses whether to load the application. Therefore, Application Launcher can be configured to request license units for applications that are not NLS-aware.

1.4 What's Next

To properly implement and manage licenses, see the following:

- ♦ [Section 2.1, “Guidelines for Configuring NLS,” on page 20](#)
- ♦ [Section 2.4, “Guidelines for Installing License Certificates,” on page 21](#)
- ♦ [Section 2.5, “Installing and Removing License Certificates,” on page 21](#)

Managing Licensing and Certificates

2

IMPORTANT: Open Enterprise Server includes MLA licenses which have replaced regular server license certificates and user licenses. For more information, see [Section 1.1, “OES NetWare Includes MLA License Files,” on page 11](#).

When you install an OES NetWare® server, the installation program automatically installs Novell® Licensing Services (NLS) on that server. To manage NLS, you use Novell iManager. For more information on accessing iManager, see the *Novell iManager 2.7 Administration Guide*.

NOTE: The licensing plug-in for iManager is incompatible with the Novell browser found on the server.

OES NetWare includes licenses for two cluster nodes. Licenses for additional cluster nodes may be purchased separately.

You can also use SNMP to view information about your network and licensing. See [“Using SNMP” on page 26](#).

The following tasks help you manage licenses on your network.

- ♦ [Section 2.1, “Guidelines for Configuring NLS,” on page 20](#)
- ♦ [Section 2.2, “Verifying That Novell Licensing Services Is Installed,” on page 20](#)
- ♦ [Section 2.3, “Managing Licenses with Novell iManager,” on page 21](#)
- ♦ [Section 2.4, “Guidelines for Installing License Certificates,” on page 21](#)
- ♦ [Section 2.5, “Installing and Removing License Certificates,” on page 21](#)
- ♦ [Section 2.6, “Moving a License Certificate,” on page 23](#)
- ♦ [Section 2.7, “Managing License Units,” on page 23](#)
- ♦ [Section 2.8, “Creating a Serial Number Report,” on page 23](#)
- ♦ [Section 2.9, “Managing Server License Assignments,” on page 24](#)
- ♦ [Section 2.10, “Viewing Licensing Information,” on page 24](#)
- ♦ [Section 2.11, “Changing License Types,” on page 28](#)

2.1 Guidelines for Configuring NLS

- ❑ Prepare the network.

If you are upgrading a server, the server should have a read/write replica of the partition where the OES NetWare server is installed.

- ❑ Provide fault tolerance.

Two servers running NLS in a partition provide fault tolerance. If one server goes down, the other provides required licensing services.

We recommend that the master replica be on one of these servers.

- ❑ Upgrade existing NLS.

Before installing OES NetWare, ensure that your servers have the following Support Packs installed.

Table 2-1 *Support Pack List*

NetWare Version	Support Pack
NetWare 4	NetWare 4 Support Pack 6a or later
NetWare 5.0	NetWare 5.0 Support Pack 4 or later
NetWare 5.1	NetWare 5.1 Support Pack 2 or later

NOTE: If you are running NetWare for Small Business 4.2; Novell Small Business Suite 5, 5.1, or 6; or NetWare for Growing Business 4.2, 5.0 or 5.1, you should install the corresponding NetWare or Consolidated Support Pack before upgrading to OES NetWare.

- ❑ Know where to install licensing certificates.

For more information, see [Section 2.4, “Guidelines for Installing License Certificates,” on page 21](#).

2.2 Verifying That Novell Licensing Services Is Installed

If you are unsure if NLS has been installed, or need to verify if NLS is actively running, complete the following:

- 1 At the server console GUI, click *Novell > Install*, and then look for an NLS entry.
- 2 Do one of the following:
 - ♦ If `nls1sp.nlm` is running on the server, enter the following at the server console:

modules nls*

- ♦ If NLS_LSP_servername is a leaf object in eDirectory, view this object in Novell iManager.

2.3 Managing Licenses with Novell iManager

Typically, you use Novell iManager to manage your licenses. When using Novell iManager, you might come across the following issues:

- ♦ When using the History button to select a license or license container, the license name is incorrectly copied. For example, if you select a license container from the history that displays as Novell+NetWare 6 User+650.users.mycompany, the plus (+) symbol is replaced by a space and the selected result is Novell NetWare 6 User 650.users.mycompany. When the selected result is used, iManager returns a 601 error code. Either replace the spaces with the plus symbol or do not use History to select a license or license container.
- ♦ The licensing plug-in for iManager is incompatible with the Novell browser found on the server.

2.4 Guidelines for Installing License Certificates

Use the following guidelines below when installing your license certificates in the eDirectory™ tree:

- ♦ Place user license certificates in or above the users' eDirectory context. In the User Access Licensing model, NLS searches for a license certificate starting at the user's context.
- ♦ Place server licenses in the server's eDirectory context.
- ♦ Smaller companies can place license certificates at the topmost Organization container. Companies with more complex eDirectory trees should place license certificates lower in the tree, closer to the Organizational Unit that contains the User objects.
- ♦ If you want users in two different contexts to use the same license certificate, the certificate must be placed in a common container above the users' contexts.

Scenario: A company has 10 users split across three organizational units: Accounting, Research, and Purchasing. In order for the 10 users to access the licenses, the licenses should be placed high enough in the tree for NLS to find it, typically in a container common to all of the organizational units or distributed through the three organizational units.

- ♦ Except for licenses provided to large companies with License Agreement contracts with Novell, a license cannot be installed in more than one container.
- ♦ If you have a remote site and a WAN link, place a license certificate in the remote site's context.

2.5 Installing and Removing License Certificates

You can install license units contained within a single license certificate or an envelope.

2.5.1 About Single Certificates

When a certificate for an NLS-aware application is installed, NLS adds a License Container object to the tree and a License Certificate object to that container object. You select the context or location in the eDirectory tree for that License Container object.

You install license certificates by accessing envelope files (.nlf).

If you purchase and install additional license certificates, they also are added to the eDirectory tree as objects in the appropriate License Container object.

2.5.2 About Envelopes

An envelope is an .nlf file containing one or more license certificates. (The envelope might have just one certificate because it also contains other information associated with the product—for example, information for NIS-enabled installations.)

Envelopes let you install more than one license certificate at a time into License Container objects. For example, if you have purchased three products in a suite, you can use an envelope to simultaneously install license certificates for all three products.

When adding license certificates to the eDirectory tree, you should know where in the tree you want to install the license certificate. This location or context determines who can use the license units associated with that license certificate. For more information on placing licenses, see [Section 2.4, “Guidelines for Installing License Certificates,”](#) on page 21.

2.5.3 Installing License Certificates

1 In Novell iManager, click *Licenses > Install a License*.

2 Navigate to and select a license file, then click *Next*.

The file might be on a diskette in drive A: or on a CD-ROM.

A sample path and filename for a license certificate is a:\license\43d211.nls. A sample path and filename for an envelope is a:\license\.43d23e.nlf.

The file, usually linked to an activation file (key), automatically retrieves the password (if one is available).

3 Select the licenses to install, then click *Next*.

Each license includes the user licenses and a server license. Each server must have a server license associated with it.

If the licenses are to be installed in different contexts, you should install the licenses one at a time.

If you choose to install a server license and one is already assigned to the server, the server license install fails.

4 Fill in the following fields:

Location: Browse to or enter the context where you want the licenses installed. User licenses should be installed at or above the user's context. You might want to install the licenses high in the tree so that they are available to more users. Server licenses should be installed at or above the server's context.

Server Assignment: If you are installing a server base license, the Server Assignment field displays. Browse to or enter the fully distinguished name of the Server object you want the license assigned to.

Enter an Activation Key: This field displays only if you are required to provide an activation key to unlock a license. You can either enter the key as text or select an activation key file to be read from a disk.

The results of installing the licenses appears.

- 5 To install another license or to reinstall a license that failed, click *Continue*; otherwise, click *Done*.

2.5.4 Deleting a License Certificate

- 1 In Novell iManager, click *Licenses > Delete License*.
- 2 Navigate to and select a license to delete, then click *Next*.
- 3 Confirm that this is the license to delete, then click *OK*.

2.6 Moving a License Certificate

- 1 In Novell iManager, click *Licenses > Move a License*.
- 2 Navigate to and select a license to move, then click *Next*.
- 3 Navigate to and select the context where you want to move the license to, then click *Next*.

A results screen displays.

- 4 Click *OK*.

2.7 Managing License Units

License units are consumed when a user logs into the network. The license unit is consumed until by the user until a period of 90 days has transpired since the last network log in by the user. If you need to release a license unit sooner, complete the following:

- 1 In Novell iManager, click *Licenses > Manage License Properties*.
- 2 Navigate to and select a license to manage.
- 3 Click *Units in Use*.
- 4 Select the user you want to remove the license unit assignment from.
- 5 Click *Remove*.

2.8 Creating a Serial Number Report

The following creates a list of license certificates and their serial numbers from a specified container and below in a .csv file. This report might take several minutes to create the report depending on how much of the eDirectory tree is must search.

- 1 In Novell iManager, click *Licenses > Run Serial Number Report*.
- 2 Navigate to and select the container where you want the search to begin.

The search includes all subcontainers below the container you select.

- 3 When the report is complete, you are prompted to either open the report or save it.

2.9 Managing Server License Assignments

Use the following tasks to manage server license assignments:

- ♦ [Section 2.9.1, “Assigning Licenses to a Server,” on page 24](#)
- ♦ [Section 2.9.2, “Modifying or Deleting Server Assignments,” on page 24](#)

2.9.1 Assigning Licenses to a Server

Each server needs a server license. You need to install a server license only if you did not install licenses during the installation process or if the server license was deleted. To install a server license certificate, follow the steps in [“Installing License Certificates” on page 22](#).

2.9.2 Modifying or Deleting Server Assignments

- 1 In Novell iManager, click *Licenses > Manage License Properties*.
- 2 Navigate to and select a license file, then click *Next*.
- 3 Do one of the following:
 - ♦ Enter the fully distinguished name of the Server object you want the license assigned to.
 - ♦ Delete a server assignment by removing the server information from the field.
- 4 Click *Done*.

2.10 Viewing Licensing Information

When you install a license certificate or create a metered certificate, a License Certificate object is added to the License Container object in the eDirectory database. If License Container object doesn't already exist, NLS creates it.

- ♦ [Section 2.10.1, “Using Novell iManager,” on page 24](#)
- ♦ [Section 2.10.2, “Using Novell Remote Manager’s Health Monitor,” on page 25](#)
- ♦ [Section 2.10.3, “Using the Version Console Command,” on page 25](#)
- ♦ [Section 2.10.4, “Using SNMP,” on page 26](#)

2.10.1 Using Novell iManager

You can use Novell iManager to view information about licenses and their usage for the License Certificate container or license.

- 1 In Novell iManager, click *Licenses > Manage License Properties*.
- 2 Navigate to and select a license file, then click *Next*.
- 3 Click the tab corresponding to the information you want to view.

2.10.2 Using Novell Remote Manager's Health Monitor

You can view a server's licensing information through the Novell Remote Manager Health Monitor. You can also set trace information for NLS components by completing the following:

The Licensing Information section displays the same information as the `version` console command, allows you to set licensing system options, and create a licensing system report.

NOTE: The NetWare usage information that was provided through Novell Remote Manager in NetWare 6.0 has been moved to iManager. See [Chapter 4, "Metering Network and Product Usage," on page 33](#).

- 1 Log in to Novell Remote Manager.
See the *OES 2 SPI: Novell Remote Manager for NetWare Administration Guide* for more information.
- 2 Click *Health Monitor > Licensing Information*.
- 3 (Optional) Click *Licensing System Options* to configure the trace settings or click *Licensing System Report* to view or e-mail a report about licensing on this server.

2.10.3 Using the Version Console Command

Licensing information has been added to the `version` command executed at the server console. The `version` command now displays the information about the server license and user licenses.

If you are using the 90-day evaluation license included with OES 1 NetWare in the `\LICENSE` folder, the following is displayed by the `version` command:

```
Server License: Novell NetWare 6 Server Eval 650 SN:123456789
```

```
User License: Novell NetWare 6.5 User Eval 650 (Hard Stop)
```

If you installed an MLA license, the following is displayed:

```
Server License: Novell NetWare 6.5 Server 650 SN:123456789
```

```
User License: Audited
```

If a license has not been installed or has not yet been identified by the server, the following is displayed:

```
Server License: Novell NetWare 6.5 Server Eval 650 Not Acquired
```

If a license has expired, the following is displayed:

When deleting and installing licenses, you need to flush the NLS cache. For more information, see [Section 7.30, “I replaced my expired licenses. Why am I still getting messages saying that my licenses are expired?”](#) on page 54.

2.10.4 Using SNMP

You can use SNMP to find out about licensing service events on your network.

- ♦ [“About SNMP and NLS”](#) on page 26
- ♦ [“Why You Need a Management Console”](#) on page 26
- ♦ [“Three Configuration Files for SNMP”](#) on page 27
- ♦ [“Implementing SNMP”](#) on page 27

About SNMP and NLS

SNMP is a management interface and high-level protocol. General-purpose protocols such as IPX™, TCP/IP, and UDP can host SNMP. NLS takes events and errors, wraps them in one of these protocols, and sends them to a management utility or console.

For example, suppose you instruct SNMP to raise an event whenever a license unit is conveyed to a User object. Every time a license unit is conveyed, SNMP sends a packet to a management console. The console registers that event. As network administrator, you can view these packets at the management console.

With SNMP, you can send out a wide variety of different events. NLS provides a list of events and errors that the licensing service can send out notifications on. As network administrator, you choose the events that you are interested in. You can turn off all events, turn them all on, or turn on selected events.

For example, NLS sends broadcast messages. Using SNMP, you can send an SNMP message with the same content to a management console.

In short, SNMP enables you to be aware of what’s happening on the network.

Why You Need a Management Console

An SNMP management product—for example, OpenView* or ManageWise®—resides on the network and registers itself as the management console. An SNMP agent (`snmp.nlm`) runs on a NetWare server. The SNMP pieces on each server send the SNMP datagrams to the console. You use the console to track what’s happening on the network.

You can place the management console anywhere on the network. This console reads the SNMP packets and displays their contents to you, as the network administrator. Typically these consoles are run on client computers for convenience, but that functionality can be implemented on any computer on the network.

Three Configuration Files for SNMP

NLS uses three configuration files for SNMP. The configuration files allow the various systems which provide SNMP information to tailor that information to your needs as you manage the network. All three files are installed into `sys:\etc`.

snmp.cfg lets you add descriptive strings that might be included in SNMP packets. These packets provide you with specific information, such as server name, computer hardware description, location, and whom to contact in case of an issue.

nlstrap.cfg lets you specify which NLS events and errors you want to track. `nlstrap.cfg` has a list of all possible events that NLS could ever send out. The file contains two lines for each event. The first line is a description. The second line enables or disables notification for that event. If the line begins with a pound sign (#), no message is sent.

By default, all lines (events) are commented out. To see an event, you edit `nlstrap.cfg`. The file contains a description at the top about the format and what to do with each value. You just turn on what you want to see.

If `nlstrap.nlm` detects an event that is enabled in the `nlstrap.cfg` file, `nlstrap.nlm` calls routines provided by `snmp.nlm` to place the SNMP packet on the network.

traptarg.cfg lets you specify all targets (or receivers) that are to receive SNMP trap messages generated by the SNMP agent (`snmp.nlm`). It pairs targets with a protocol for SNMP packet addressing. For example, a server named PUFFIN in the IPX section of `traptarg.cfg` instructs NLS to send SNMP messages to server PUFFIN using IPX.

Implementing SNMP

- 1 Edit `nlstrap.cfg` to set events that you want to monitor.

Specify parameters by using a parameter keyword followed by the desired parameter value. Then unload and reload `nlstrap.nlm`. (The changes won't take effect until you reload `nlstrap.nlm`.)

- 2 Edit `snmp.cfg`.

- 3 Edit `traptarg.cfg` to specify all targets that are to receive SNMP trap messages.

- 4 Run the management console.

- 5 Load `snmp.nlm` on a server.

`Snmp.nlm` (the SNMP agent) provides the APIs and framework to allow SNMP to work on NetWare. `snmp.nlm` traps events, generates SNMP messages about the trapped events, and sends the messages to the management console.

- 6 At the management console, view the SNMP messages.

2.11 Changing License Types

Sometimes you may have a mixture of Red Box™, MLA, Demo and other licenses installed in the same tree. Although this is possible and can function properly, it can produce questions about why certain servers and users are consuming specific license units. You should avoid mixing license types; however, sometimes this is necessary for a short period of time. Two examples of instances where mixed licensing types might coexist would be

- ♦ [Changing from Demo to Red Box Licensing \(page 29\)](#)
- ♦ [Switching from MLA Licensing Back to Red Box Licensing \(page 30\)](#)

2.11.1 Issues when Changing Versions of NetWare

- ♦ [“Changing from NetWare 4 Licensing” on page 28](#)
- ♦ [“Changing from NetWare 5 Licensing” on page 28](#)

Changing from NetWare 4 Licensing

NetWare 4 licenses are stored on the `sys :` volume and are additive without downing the server. Up to eight licenses can be added, thus increasing the user count. To switch between license types, say from Demo to Red Box, requires removal of all existing licenses and installation of the new licenses. Users may remain connected during this process, but may need to reboot once the license changes have been completed. These changes may be performed across an Rconsole connection and licenses may be installed from the workstation across Rconsole. However, connectivity using Rconsole in a distributed environment can prove challenging if SPX connectivity is not available across routers or wan links. In today's IP environment, the IPX protocol may have been disabled.

Changing from NetWare 5 Licensing

NetWare 5 licenses are installed in directory services. These licenses can be deleted and reinstalled without downing the server if the server is running NetWare 5.0 Support Pack 6 or later or NetWare 5.1 Support Pack 3 or later.

Licenses can be installed or removed from any Windows workstation that has access to the tree. The administrator uses NWAdmin to make these changes. Users may remain connected during this change and acquire the changed license (assuming the change provides enough licenses for connected users.) If fewer licenses are available after the change, users retain their connection until they restart their computer. The Novell Licensing service will then permit users to consume licenses only for the available license units. Although this can be administered from a single workstation, any server requiring license changes must be accessed.

IMPORTANT: Red Box licensing refers to off-the-shelf purchases of licenses. Because they usually come in the red Novell box, they are referred to as Red Box licenses. Typical license units sold are 5, 10, 25, 50, 100 user, etc.

MLA (Master License Agreement) licensing is unlimited license consumption and is obtained through contract with Novell.

Having an MLA license installed as part of an OES purchase does not constitute having an MLA agreement with Novell. Unless you actually have an MLA contract with Novell, you are using Red Box licensing, and the number of user connections you can legally allow is specified in paper licenses issued with your OES purchase.

2.11.2 Changing from Demo to Red Box Licensing

- 1 Install the Red Box server certificate in the same context as the Demo server certificate and assign it to the same server.
- 2 Install the appropriate number of user license certificates in user contexts where user objects exist.

If the new user licenses reside in contexts along the path to Root from the user objects, then existing connections do eventually acquire the correct licenses when licensing has switched from Demo to Red Box licensing.
- 3 After appropriate Red Box licensing is installed, with a server certificate assigned to the same server, delete the Demo server certificate and the Demo User certificate.
- 4 Unload `polimgr.nlm`, then unload `nlsisp.nlm`. Reload `polimgr.nlm` (which loads `nlsisp.nlm`.) If you don't unload `nlsisp.nlm`, license policy information remains cached and `polimgr.nlm` reacquires the deleted Demo server certificate. Unloading `nlsisp.nlm` does not clear current connections.

Policy Manager sees that it is in an unknown state and switch to its initial startup mode. It begins looking for a server certificate containing strings matching those hard-coded into the current OS. This information comes from `pmlovr.nlm`, which is bound into `server.exe`. If matching Publisher, Product and version strings are found, Policy Manager attempts to acquire the discovered server certificate. These certificates are discovered in the order in which they are found within eDirectory. This order, within a single container, is usually the order in which they are installed into eDirectory.

- 5 If the discovered certificate is an MLA certificate of the appropriate Publisher, Product and version, it consumes a unit.

If the discovered certificate is a non-MLA certificate, it checks to see if the current server is assigned to this certificate. If so, it consumes a unit from the discovered certificate with the matching string information. If the server is not assigned to this non-MLA certificate, Policy Manager does not consume a license unit from the certificate.

NOTE: Discovery order takes precedence over assignment. Assume I install MYSERVER into OU=SERVERS.O=CORP with an MLA license in OU=SERVERS.O=CORP. If I then install a Red Box server license with server assignment MYSERVER into O=CORP, `polimgr.nlm` consumes a unit of the MLA server license, not the Red Box server license. Even though a specific server assignment is made to the Red Box license, `polimgr.nlm` never sees this license because `polimgr.nlm` stops searching for available server licenses when it finds a suitable license. (In this case, the MLA certificate).

- 6 After the server has acquired its server certificate, it determines the type of licensing in force on that server, such as Red Box, Demo, DevNet, Education or MLA, based on the server certificate type. It then begins a check of all current connections. (Upgrade and Red Box licenses are considered the same type.)

- 7 If a connection was present before the change in licensing type, such as from Demo to Red Box, `polimgr.nlm` attempts to find and consume a client unit appropriate for the type of server. Presently, that means that a NetWare 5.1 Support Pack 3 or previous server client connection begins an eDirectory search starting in the server's context. `Polimgr.nlm` attempts to consume an SCL (Server Connection License) certificate assigned to the same NetWare 5.1 server.
- 8 If the connection is to a NetWare 6 server, `polimgr.nlm` begins an eDirectory search starting in the user object's context. It attempts to consume an appropriate type of UAL (User Access License) certificate. UAL certificates are not assigned to individual servers but simply reside in eDirectory.

2.11.3 Switching from MLA Licensing Back to Red Box Licensing

The process is the same as [Section 2.11.2, “Changing from Demo to Red Box Licensing,” on page 29](#). However, you typically install one MLA license in an organization. Numerous servers located within the directory services structure below that organization may be installed and consume that MLA license. If a customer wants to switch back to Red Box, then server licenses must be installed and associated with each server individually. Then you can remove the MLA licenses. Each server must unload `nlsisp.nlm`, unload `polimgr.nlm` and reload `polimgr.nlm`. This assumes that Support NetWare 5.0 with Support Pack 6 or later or NetWare 5.1 Support Pack 3 or later, or NetWare 4 with Support Pack 6a have been installed.

Users can remain connected during this process.

Running Licensing Services in a Virtualized Environment

3

Novell® Licensing Services runs in a virtualized environment just as it does on a physical NetWare® server, and it requires no special configuration or other changes.

To get started with virtualization, see “[Introduction to Xen Virtualization](http://www.novell.com/documentation/sles10/xen_admin/data/sec_xen_basics.html)” (http://www.novell.com/documentation/sles10/xen_admin/data/sec_xen_basics.html) and “[Setting Up a Virtual Machine Host](http://www.novell.com/documentation/sles10/xen_admin/data/cha_xen_virtualization_vhost_setup.html)” (http://www.novell.com/documentation/sles10/xen_admin/data/cha_xen_virtualization_vhost_setup.html) in the *Virtualization with Xen* (http://www.novell.com/documentation/sles10/xen_admin/data/bookinfo.html) guide.

For information on setting up virtualized NetWare, see “[Installing OES 2 SP1 NetWare on a Xen Virtual Machine](#)” in the *OES 2 SP1: NetWare Installation Guide*.

For information on setting up virtualized OES 2 Linux, see “[Installing, Upgrading, or Updating OES 2 SP1 Linux on a Xen-based Virtual Machine](#)” in the *OES2 SP1: Linux Installation Guide*.

Metering Network and Product Usage

4

IMPORTANT: Open Enterprise Server (OES) includes MLA licenses which have replaced regular server license certificates and user licenses. For more information, see [Section 1.1, “OES NetWare Includes MLA License Files,” on page 11](#).

From Novell® iManager, you can view NetWare® usage information from the NetWare Product Usage task. If a product is meter enabled, you can also view usage information about that product. The Metering task generates a statistic or a report of the number of users that logged in to the network over a specified period of time. If you are managing license agreement contracts, you might find this tool helpful as you prepare for audits.

NOTE: Metering information is available only on NetWare 6 servers running NetWare 6 support Pack 3 or later and NetWare 6.5 servers, or OES NetWare servers.

The following sections help you monitor your network usage:

- ♦ [Section 4.1, “Understanding How Metering Information Is Gathered,” on page 33](#)
- ♦ [Section 4.2, “Configuring the Metering Service,” on page 33](#)
- ♦ [Section 4.3, “Configuring Metering for a Server,” on page 34](#)

4.1 Understanding How Metering Information Is Gathered

Each server gathers information regarding authentications and saves the information in a database. A server is then assigned to be the collection server and the authentication information is passed to this server. The collection server gathers this information and displays it when requested by the metering. You can specify the collection server.

The metering tool uses `nwusage.nlm` and `nlsrlrup.nlm` to gather the usage information. Other NLM™ programs that support these modules include `connaud.nlm`, `nlsmeter.nlm`, and `nlsadapt.nlm`.

`Nlsrlrup.nlm` gathers information in its database only for NetWare 6 and later servers running in the same tree. Information is not available for NetWare 5 or NetWare 4 servers.

4.2 Configuring the Metering Service

To configure the metering service to function as needed on your network:

- 1 In Novell iManager, click *NetWare Product Usage > Configure Service*.
- 2 Modify the settings, then click *OK*.
For more information about these settings, click *Help*.

TIP: These parameters can also be set at the server console. Use the `nlsrup help` command to display the commands for setting the configuration options at the server console.

4.3 Configuring Metering for a Server

To configure how a server participates with metering:

- 1** In Novell iManager, click *NetWare Product Usage > Configure a Server*.
- 2** Select the server you want to configure.
- 3** Modify the settings.

For more information about these settings, click *Help*.

- 4** (Optional) Click *Advanced* if you want to do any of the following:
 - ♦ View a list of participating servers
 - ♦ View a recommendation for a collector server
 - ♦ Enroll the server in the collection of metering information
 - ♦ Display statistics about this server's participation in metering

TIP: These parameters can also be set at the server console. Use the `nlsrup help` command to display the commands for setting the configuration options at the server console.

Troubleshooting Novell Licensing Services

5

IMPORTANT: Open Enterprise Server includes MLA licenses which have replaced regular server license certificates and user licenses. For more information, see [Section 1.1, “OES NetWare Includes MLA License Files,” on page 11](#).

This section contains tips, information about system messages and error codes, and a list of Technical Information Documents.

- ♦ [Section 5.1, “Tips,” on page 35](#)
- ♦ [Section 5.2, “Error Codes and System Messages,” on page 36](#)
- ♦ [Section 5.3, “TIDs,” on page 37](#)

5.1 Tips

- ♦ [Section 5.1.1, “Unable to Get a Server Base License,” on page 35](#)
- ♦ [Section 5.1.2, “No Access to License Units,” on page 35](#)
- ♦ [Section 5.1.3, “The System Erroneously Reports Duplicate Licenses,” on page 36](#)

5.1.1 Unable to Get a Server Base License

If the server console displays “Unable to get a Server Base license,” you should delete and reinstall the license certificate. If you use Novell iManager, you must manually make a server assignment during the installation of the licenses certificate. (If you are an MLA account, do not make a server assignment.)

5.1.2 No Access to License Units

If License Service Provider objects are not well placed in the eDirectory™ tree, some NLS clients might not have access to licensing services

Place license certificates as close as practical to the actual users but high enough in the eDirectory tree so that everyone who needs to access them can do so.

Consider the following guidelines:

- ♦ Place server license certificates so that NLS servers do not need to traverse slow WAN links to access license units.
- ♦ Place user certificates so that NLS do not need to traverse WAN links when users are authenticating to the tree.
- ♦ Place at least one License Service Provider object in a container near the root of the tree. Also, consider loading license service provider software on servers that many or most users log in to in the eDirectory tree. These two actions distribute requests for license units.

- ♦ Identify license certificates that many users throughout the eDirectory tree use. Place these license certificates in a context near the root of the eDirectory tree.
- ♦ Identify license certificates that a small group use. Place these license certificates in the same eDirectory context as those users' objects.
- ♦ Identify license certificates that larger groups use. Place these certificates in the eDirectory context that represents the root-most context for the group.

5.1.3 The System Erroneously Reports Duplicate Licenses

Problem: The system reports that duplicate licenses are installed in the eDirectory tree.

Possible cause: In a using earlier versions of NLS, you installed a license certificate, deleted it, and then reinstalled it elsewhere in the eDirectory tree. When the earlier NLS dredge process walks the eDirectory tree and looks for certificates, the dredge encounters the deleted certificate and considers it a duplicate.

Solution: If that license certificate was the only certificate in the License Container object, delete the License Container object where the certificate was installed and deleted. (Don't delete the License Container object if it contains other license certificates.)

Solution: Deploy the current version of NLS by installing the NetWare 4 Support Pack 6a and NetWare 5 Support Pack 4 on you servers.

5.2 Error Codes and System Messages

Many messages for Novell® Licensing Services are self-documenting; information that you need appears on-screen with the message. Additional information about error codes are provided below. Other error codes are provided in “**NLSLSP Messages**” in *OES2 SP1: System Messages for NetWare*.

5.2.1 Error Code C0001002 Displays

Possible Problem	Possible Solutions
You removed and reinstalled eDirectory™.	See TID 2941280 (http://support.novell.com/cgi-bin/search/searchtid.cgi?/2941280.htm) .
The Server object and [Public] don't have enough rights.	<p>Make sure that the Server object (NLS_LSP_server) has the Browse right to the License Certificate objects.</p> <p>Make sure that the Server object has the Read property right to All Properties.</p> <p>Make sure that [Public] has the Browse right to the License Container object where the license certificates are stored. See TID 10013723 (http://support.novell.com/cgi-bin/search/searchtid.cgi?/10013723.htm).</p>
You deleted the server base license (a License Certificate object).	Reinstall the license certificates. See TID 2943405 (http://support.novell.com/cgi-bin/search/searchtid.cgi?/2943405.htm) .

Possible Problem	Possible Solutions
You removed the read/write replica from the NLS server. (The NLS server is running <code>nls1sp.nlm</code> . It's the server that shows up in NetWare Administrator as <code>NLS_LSP_server</code> .)	See TID 2949634 (http://support.novell.com/cgi-bin/search/searchtid.cgi?/2949634.htm).
Two NetWare 5 servers contain a replica of the [Root] or tree partition.	See TID 2950971 (http://support.novell.com/cgi-bin/search/searchtid.cgi?/2950971.htm).
NOTE: The TIDs are available at the Novell Support Web Site (http://support.novell.com/search/kb_index.jsp) .	

5.2.2 Error Code C0001005 Displays

Possible Problem	Possible Solution
The license certificate requires a server assignment but doesn't have one.	Assign a server. See "Modifying or Deleting Server Assignments" on page 24.

5.3 TIDs

The following TIDs (Technical Information Documents) might help you resolve some issues relating to NLS on your network. The TIDs are available at the [Novell Support Web Site \(http://support.novell.com/search/kb_index.jsp\)](http://support.novell.com/search/kb_index.jsp).

TID	Description
2943405 (http://support.novell.com/cgi-bin/search/searchtid.cgi?/2943405.htm)	What to do when the server is unable to obtain a valid server base license
2944797 (http://support.novell.com/cgi-bin/search/searchtid.cgi?/2944797.htm)	Installing MLA certificates
10053942 (http://support.novell.com/cgi-bin/search/searchtid.cgi?/10053942.htm)	Renaming a server
2943157 (http://support.novell.com/cgi-bin/search/searchtid.cgi?/2943157.htm)	Moving a server to a different NDS context
2949634 (http://support.novell.com/cgi-bin/search/searchtid.cgi?/2949634.htm)	Responding to a C0001002 message
10065604 (http://support.novell.com/cgi-bin/search/searchtid.cgi?/10065604.htm)	Changing from Demo to Red Box Licensing
10027731 (http://support.novell.com/cgi-bin/search/searchtid.cgi?/10027731.htm)	Troubleshooting Licensing Issues.

IMPORTANT: Open Enterprise Server includes MLA licenses which have replaced regular server license certificates and user licenses. For more information, see [Section 1.1, “OES NetWare Includes MLA License Files,” on page 11](#).

Because NLS is integrated with eDirectory™, you need to be familiar with the basics of eDirectory, especially eDirectory objects, partitions, and replicas of partitions. Understanding the following terms helps you maintain licensing and license units on your network.

- ♦ [Activation Key \(page 39\)](#)
- ♦ [Envelope \(page 39\)](#)
- ♦ [License Certificate Object \(page 40\)](#)
- ♦ [License Container Object \(page 41\)](#)
- ♦ [License Service Provider \(LSP\) \(page 41\)](#)
- ♦ [License Unit \(page 42\)](#)
- ♦ [Licensing Model \(page 42\)](#)
- ♦ [NLS Client \(page 42\)](#)
- ♦ [NLS_LSP_servername \(page 43\)](#)
- ♦ [Notification \(page 43\)](#)
- ♦ [Novell Licensing Services \(NLS\) \(page 44\)](#)
- ♦ [Policy \(page 44\)](#)
- ♦ [Policy Manager \(page 44\)](#)
- ♦ [Search for a License Unit \(page 45\)](#)
- ♦ [Stop \(page 45\)](#)
- ♦ [Unlicensed Access \(page 45\)](#)

6.1 Activation Key

A sequence of numbers and letters; allows you to complete the installation of a license certificate for a product you purchased.

All license certificates require an activation key. Software vendors usually include the activation key in a `.key` file along with the certificate. This combination enables the Activation Key to be installed automatically during installation. However, if the installation program can't locate an Activation Key, a prompt allows you to enter it.

6.2 Envelope

An `.nlf` file that contains one or more license certificates; a convenient way of packaging multiple license certificates to be distributed as a single file.

Because multiple license certificates can exist in an envelope, envelopes allow you to install several license certificates at the same time. Envelopes can contain an embedded activation key for license certificates.

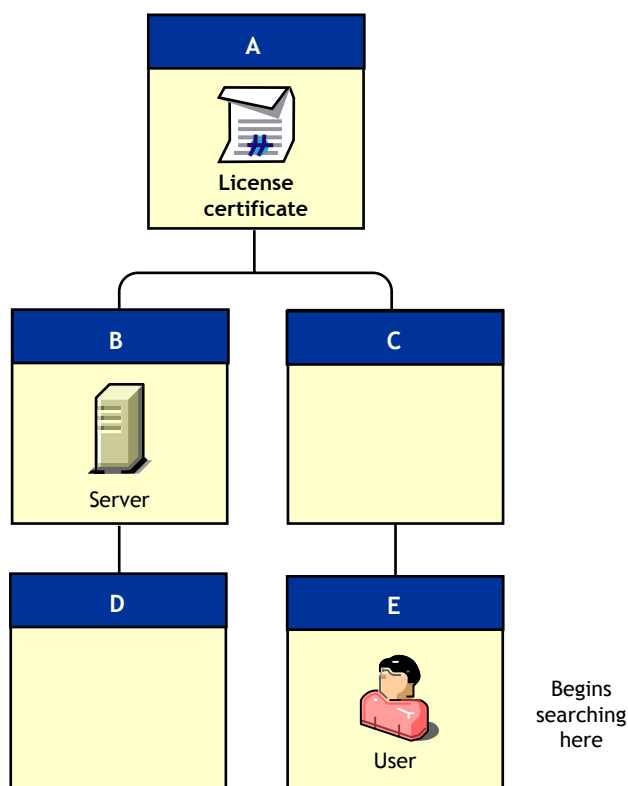
A sample envelope file is 4234171d.nlf.

6.3 License Certificate Object

An object in eDirectory; represents a license certificate.

License certificates correspond to the printed license statement that is typically included in the packaging for software products. The icon for a License Certificate object looks like a single sheet of paper representing a license certificate. When you view the object in Novell iManager, the object typically displays the serial number or certificate name, as shown below:

Figure 6-1 License Object Serial number



Certificates can be secure or unsecure:

- ♦ A *license certificate* is a digital license that is secured by secrets. For additional security, NetWare® license certificates are digitally signed. They cannot be modified. License certificates usually come from a software vendor.
- ♦ A *metered certificate* does not have secrets; it is an unsecure license certificate. ZENworks functions as the NLS client and requests license units on behalf of applications. Metered certificates are usually created by network administrators.

NLS creates a License Certificate object when you install license certificates for NLS-enabled applications or when you create metered certificates.

When you install or create a license certificate, you choose the context (location in an eDirectory tree) for this object.

License certificates contain policies and are managed by a policy manager.

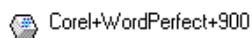
6.4 License Container Object

An object in eDirectory; contains one or more License Certificate objects.

A License Container object is a special container object in eDirectory. (Other container objects include [Root] or Tree, Country, Organization, and Organizational Unit.)

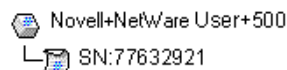
License Container objects are named using publisher, product, and version. For example, Corel* WordPerfect* version 9 could appear as follows in a tree:

Figure 6-2 License Container Object



When you install a license certificate or create a metered certificate, NLS creates a License Container object and a License Certificate object. (If a license container already exists, NLS places the additional license certificate in that existing container.)

Figure 6-3 License container with a user license certificate



Using Novell iManager, you can view License Container objects as they appear in the eDirectory tree.

6.5 License Service Provider (LSP)

Licensing software that you install and run on NetWare servers. This software is contained in the `nls lsp.nlm` program running on a NetWare 4.11 or later server.

A license service provider provides the actual licensing service. It handles requests from NLS clients and maintains the license certificates, which are stored within eDirectory.

When you install NetWare and licensing certificates, NLS

- ♦ Installs the license service provider software on the server
- ♦ Creates an License Service Provider object (`NLS_LSP_servername`) in the eDirectory tree

You can also use NetWare Deployment Manager to accomplish these two tasks.

IMPORTANT: You must have a license service provider running on a server with a writable replica of each partition. This requirement applies to partitions that contain—or will contain—License Certificate objects. If a partition does not—or will not—contain a license certificate, that partition does not require a server running an license service provider.

The replica can be a master or read/write replica. You can run license service providers on other servers without replicas as long as they can communicate with the license service provider that has a writable replica. The server with the writable replica can make changes to the eDirectory database on the other server's behalf.

6.6 License Unit

A component of a license certificate.

When you purchase a product, you purchase one or more license units for it. For example, a 100 Additive User License for Novell BorderManager® Firewall Services 3 contains 100 license units, allowing 100 users to access BorderManager services.

NLS supports digital license units that are available from installed License Certificate objects. NLS also supports metered license certificates that are managed through ZENworks® functionality.

License certificates are installed from files. Typical filename extensions are

- ♦ `.nlf` (for NetWare, BorderManager, and other Novell products)
- ♦ `.cls` (for NetWare for Small Business)
- ♦ `.key` (activation keys)

IMPORTANT: A license unit or a license certificate is not the license itself. Licenses are specified in your license agreement. Although NLS helps you stay in compliance with the license agreement, you are bound by the terms and conditions of your software agreement.

6.7 Licensing Model

The way a vendor allows its customers to use its licensed products.

NLS can support many models of licensing. For example:

- ♦ Non-concurrent connections in BorderManager
- ♦ Server Connection Licensing (SCL) in NetWare 4 and NetWare 5
- ♦ User Access Licensing (UAL) for Novell Cluster Services™ and NetWare 6

For information about the licensing model for the product that you use, refer to the product-specific documentation.

6.8 NLS Client

Software that requests licensing services from license service providers.

An NLS client runs on client workstations and on NetWare servers. (The client can run on either a workstation or a server or on both the workstation and the server.) This software supports 32-bit Windows and NetWare Loadable Module™ (NLM™) platforms. When you install NLS on a server, all of the files that enable an application to use NLS are copied to the `sys:\public` and `sys:\system` directories on the server.

Other than the client software, no additional files need to be installed on client workstations. Applications written to use NLS load client libraries that communicate with NLS components running on a NetWare server.

If a 32-bit Windows NLS client has an existing connection to a NetWare server running an license service provider, the client communicates directly with the license service provider. If the client does not already have a connection to a server running an license service provider, the client searches from the server's context upward in the eDirectory tree for an license service provider.

An NLM client does not search. It simply examines the current connection.

See [Section 1.3, "How Novell Licensing Services Works," on page 15](#) for more information.

6.9 NLS_LSP_servername

An object in eDirectory. This object's existence in the tree is one indication that NLS is configured to run on a server and that a server is a license service provider.

Both the NetWare server installation software and NetWare Deployment Manager install the license service provider software on the server and create a corresponding License Service Provider object (NLS_LSP_servername) in the eDirectory tree.

License service provider objects are created in the same context as the server running the license service provider software (nls lsp.nlm). The License Service Provider object stores configuration information about an license service provider running on the server: a transaction database name, information about how to search for a license certificate (whether to search to the partition root or to the root of the tree), notifications concerning unlicensed access and service problems, and other associated data.

NLS adds an attribute on the NCP™ Server object. This attribute points to the license service provider so that NLS has a link between the NCP Server object and the license service provider.

6.10 Notification

A message that informs you about the licensing service or a problem concerning your compliance with the terms and conditions licensing agreement.

System Alert notifications inform a designated person that one of the following has occurred:

- ♦ An eDirectory communication error related to the licensing service
- ♦ An eDirectory schema error related to the licensing service
- ♦ A transaction logging error

Out of Compliance notifications inform a designated person that your company is out of compliance with the terms and conditions of your licensing agreement.

By default, the designated person is whoever installs the license certificate. You can modify (change, delete, add) objects that receive notifications. Multiple network users or groups can receive notifications.

Notifications are sent through the NetWare Broadcast utility and (optionally) SNMP.

6.11 Novell Licensing Services (NLS)

Software components and technology that provide a balance between your company's need to manage and access license units and a software manufacturer's need for enforcement of licensing requirements.

NLS consists of the following components:

- ♦ License Service Providers (LSPs)
- ♦ NLS clients
- ♦ eDirectory objects (License Service Provider objects, License Certificate objects, and License Container objects)

6.12 Policy

An electronic representation of a term or condition in your license agreement. Policies are contained in license certificates. For example, a certificate for a company could include the following tags for policies:

- ♦ Each license unit is consumable.
- ♦ Each license unit allows nodal reuse. (A user can use it multiple times from different workstations.)
- ♦ The certificate does not require an license service provider assignment.
- ♦ Duplicate certificates can be installed (an important tag for Master License Agreement accounts).
- ♦ The certificate is an evaluation license certificate.
- ♦ The certificate has a soft stop. (The policy allows users to use the service even though a license unit is not available. However, a network administrator receives notification that the company is out of compliance.)
- ♦ The certificate uses secrets.
- ♦ The certificate is digitally signed.

A policy is tied to a license certificate and a policy manager, not to the licensing service. A policy can be flexible, simply by changing (or replacing) a license certificate.

6.13 Policy Manager

Code that makes decisions based on requests from a licensing service.

A policy manager

- ♦ Is part of the application
- ♦ Makes the application NLS-enabled
- ♦ Requests licenses from NLS
- ♦ Receives responses from NLS regarding availability of license units
- ♦ Decides whether to grant access to certain program functionality

- ♦ Informs the license service provider when a license unit is no longer being used
- ♦ Contains mechanisms (policy) for handling errors concerning failed requests for license units

Each NLS-enabled product has its own policy manager. The policy manager for NetWare differs from the policy manager for BorderManager. Both of these policy managers differ from the policy manager for a third-party software manufacturer's application.

Because each application or service supports a different policy, you might have many policy managers running on a network.

6.14 Search for a License Unit

A function that the License Service Provider (LSP) performs when an NLS client requests a license unit

When an NLS client requests a license unit in the User Access Licensing model, the license service provider first searches the User object's context for an available license unit. If the license service provider doesn't find a license unit, it searches up the eDirectory™ tree for one.

A Licensed User object is a User object that has successfully logged in to the network and obtained a license

6.15 Stop

A policy in a License Certificate object.

- ♦ A "hard stop" policy informs users that they are out of compliance with the terms and conditions of the license agreement. A hard stop prevents users from accessing a license unit. The hard stop could result from all available license units already being in use.

NOTE: NLS is a service. The terms and conditions of your license agreement determine how the product is to be used.

- ♦ A "soft stop" policy informs users that they are out of compliance but allows them to continue using license units under certain conditions.
- ♦ A "no stop" policy ignores situations in which no license units are available. NLS keeps track of the overage by logging the noncompliance, but does not inform or warn the user.

Scenario: You install licenses for 25 users. All 25 license units are in use when the 26th user attempts to log in. Because no license units are available, the user is not granted network access.

Solution: To allow the 26th user to log in to the network, you must install additional licenses or release a license that is currently in use. Releasing a license that is in use revokes network access for the User object that had the license, the next time the user attempts to log in.

6.16 Unlicensed Access

An allowance beyond the number of license units purchased.

Software manufacturers can allow unlicensed access (a grace condition) on their license certificates. This functionality allows users to continue using the product while you purchase and install more license certificates.

NOTE: Unlicensed access does not grant licenses. The terms and conditions of your license agreement specify how the product is to be used.

To see how a product handles unlicensed access, refer to the product-specific documentation. NetWare allows up to 3 grace connections.

Scenario: You install licenses for 100 users. The company hires 10 more employees, and you create network accounts for them. Even though 110 user accounts exist, only the first 100 users that log in can gain access to the network, until 10 more licenses are added to accommodate the 10 unlicensed users.

NetWare Licensing Frequently Asked Questions (FAQ)

7

IMPORTANT: Open Enterprise Server includes MLA licenses which have replaced regular server license certificates and user licenses. For more information, see [Section 1.1, “OES NetWare Includes MLA License Files,”](#) on page 11.

- ♦ [Section 7.1, “What is the Licensing Model for NetWare?,”](#) on page 48
- ♦ [Section 7.2, “How does User Access Licensing differ from earlier versions of NetWare?,”](#) on page 48
- ♦ [Section 7.3, “What is the difference between NetWare 5 licenses and NetWare 6 and later licenses?,”](#) on page 49
- ♦ [Section 7.4, “Why did Novell change to User Access Licensing?,”](#) on page 49
- ♦ [Section 7.5, “What are the benefits of User Access Licensing?,”](#) on page 49
- ♦ [Section 7.6, “How many license units will I consume?,”](#) on page 49
- ♦ [Section 7.7, “How many license units do I need to purchase?,”](#) on page 49
- ♦ [Section 7.8, “Does a person who has more than one workstation need multiple licenses?,”](#) on page 50
- ♦ [Section 7.9, “Does a User object that is duplicated across multiple trees need more than one license?,”](#) on page 50
- ♦ [Section 7.10, “What types of OES NetWare user licenses are available?,”](#) on page 50
- ♦ [Section 7.11, “When is a license unit consumed?,”](#) on page 50
- ♦ [Section 7.12, “When is a license unit released?,”](#) on page 50
- ♦ [Section 7.13, “Do printers need a license under the NetWare User model?,”](#) on page 50
- ♦ [Section 7.14, “Does a person who has two or more User objects assigned to him need multiple licenses?,”](#) on page 50
- ♦ [Section 7.15, “My company has computers shared by multiple users across shifts. How many licenses do we need?,”](#) on page 51
- ♦ [Section 7.16, “Do I still need a server license?,”](#) on page 51
- ♦ [Section 7.17, “What kind of user licenses are available?,”](#) on page 51
- ♦ [Section 7.18, “Where should I place the license certificate in eDirectory?,”](#) on page 51
- ♦ [Section 7.19, “Where should I place my MLA license certificate?,”](#) on page 52
- ♦ [Section 7.20, “Does having an MLA license installed authorize unlimited user connections on my network?,”](#) on page 52
- ♦ [Section 7.21, “How do I monitor license compliance with MLA licenses?,”](#) on page 53
- ♦ [Section 7.22, “How do I change from one license type to another?,”](#) on page 53
- ♦ [Section 7.23, “Can I install user licenses during the OES NetWare server installation?,”](#) on page 53
- ♦ [Section 7.24, “How do I add, view, and delete licenses?,”](#) on page 53

- ♦ Section 7.25, “Are NetWare 5.1 licenses compatible with OES NetWare?,” on page 53
- ♦ Section 7.26, “How do I look at my installed licenses?,” on page 53
- ♦ Section 7.27, “How can I monitor consumption of user licenses?,” on page 54
- ♦ Section 7.28, “After installing an OES NetWare server, I can log in only once or twice before failing to log in or map drives. Why?,” on page 54
- ♦ Section 7.29, “Why are my NetWare licenses expired?,” on page 54
- ♦ Section 7.30, “I replaced my expired licenses. Why am I still getting messages saying that my licenses are expired?,” on page 54
- ♦ Section 7.31, “Why can’t I map a drive?,” on page 54
- ♦ Section 7.32, “Why can’t I log in or map drives after replacing the Demo licenses?,” on page 55
- ♦ Section 7.33, “What files are on the license diskette?,” on page 55
- ♦ Section 7.34, “How does NetWare handle license activation keys?,” on page 55
- ♦ Section 7.35, “What tools are available to manage licensing in NetWare?,” on page 55
- ♦ Section 7.36, “How can I see NLS errors? They don’t display on the console.,” on page 56
- ♦ Section 7.37, “Where can I see a list of NLS error codes?,” on page 56
- ♦ Section 7.38, “How can I learn more about Novell Licensing Services?,” on page 56

7.1 What is the Licensing Model for NetWare?

Beginning with NetWare® 6, NetWare uses a User Access License model where User objects gain access to network services by connecting to the network instead of to servers.

7.2 How does User Access Licensing differ from earlier versions of NetWare?

In previous versions of NetWare, a Server Connection License model is used, where users are granted access to network services on a per-server basis. This means each time a user accesses services on a different server, the user consumes a license unit on that server. Printer connections also consume a connection license.

In the NetWare User Access License model, users consume a single User license (per tree) regardless of the number of NetWare servers they log on to. Printers that connect to a NetWare server do not consume a User license. The same is true for all other non-User connections.

Once a user logs in to the tree, the license unit is assigned to that userID for 90 days, making it essentially a permanent assignment. Thus, if a company has installed a five-user license and has 10 employees, the first five can log in, logout, and leave the country. The remaining five users are not be able to get a license until 90 days after the other users have logged out, or until another five-user license is installed. License units that are in use can be manually released through Novell® iManager.

Because most users map more than one drive and possibly several printers, most companies find their overall unit consumption reduced with the NetWare licensing model, despite the persistent nature of license unit assignments.

7.3 What is the difference between NetWare 5 licenses and NetWare 6 and later licenses?

NetWare 5 uses the Server Connection License (SCL) model while NetWare 6 and later uses the User Access License (UAL) model. The SCL model consumes a license unit for every resource consumed in the tree and is concurrent. The UAL model consumes a license unit when a user logs in to the tree and does not consume additional units for resources consumed in the tree.

NetWare 5, NetWare 6, NetWare 6.5, and OES NetWare servers with their associated licenses can coexist in the same eDirectory™ tree.

7.4 Why did Novell change to User Access Licensing?

Novell® changed to the User Access License model in response to customer requests. Using the tools available to administrators such as Novell iManager and Novell Remote Manager, you can more easily monitor and manage licensing.

OES NetWare further simplifies license management by providing an MLA license file on all NetWare installation media. See [Section 1.1, “OES NetWare Includes MLA License Files,” on page 11](#).

7.5 What are the benefits of User Access Licensing?

The benefits of user access licensing include the following:

- ♦ Easier to plan because each network user consumes a user license
- ♦ Easier to track using the NetWare Usage tool in Novell Remote Manager
- ♦ Easier to deploy as User licenses

7.6 How many license units will I consume?

Each network user consumes one license unit, regardless of the number of network services and NetWare servers accessed within a single eDirectory™ tree.

7.7 How many license units do I need to purchase?

Determining the number of user access licenses needed is simple. First determine the total number of users that will be accessing the network. Then purchase the equivalent number of user licenses.

For example, if you have 112 users all in one context who will be accessing resources on your network, you need to purchase a minimum of 112 licenses. Since user licenses are sold in quantities of 5, 10, and 25 license units, you need to purchase at total of a 115 license units

7.8 Does a person who has more than one workstation need multiple licenses?

No. As long as users access all workstations with the same eDirectory user object, they are not required to have more than one license.

7.9 Does a User object that is duplicated across multiple trees need more than one license?

A user license is needed for each User object within a tree. If a user has identical, multiple User objects across multiple trees, he needs a separate license for each. However, if you link these directory trees by using products such as Novell's Identity Manager (DirXML™), you only need one user license.

7.10 What types of OES NetWare user licenses are available?

OES NetWare doesn't include user licenses. User connections are limited only through a paper license agreement with Novell. However, user connections are still monitored, and the same restrictions apply as were in force when user licenses were installed in eDirectory. For more information, see [Section 1.1, "OES NetWare Includes MLA License Files," on page 11](#).

For more information on license agreements, see the [Novell Licensing Programs \(http://www.novell.com/licensing\)](http://www.novell.com/licensing) Web site.

7.11 When is a license unit consumed?

When a user accesses a network resource, a license is consumed and assigned to the User object. The license unit is not released when the user logs out.

7.12 When is a license unit released?

A user license unit remains assigned to a User object for 90 days since the user's last network access. You can manually release an assigned license unit using Novell iManager or NetWare Administrator. See [Section 2.7, "Managing License Units," on page 23](#) for more information.

7.13 Do printers need a license under the NetWare User model?

No. Only User objects (or other classes of object that contain data representing a person, such as objects containing credit card information or PIN numbers) that access the software services require a user license.

7.14 Does a person who has two or more User objects assigned to him need multiple licenses?

Yes. A person who has multiple unique user IDs does need a separate license for each different ID.

7.15 My company has computers shared by multiple users across shifts. How many licenses do we need?

Each person who accesses the software services should have a unique eDirectory User object, and each of these objects needs a license. So if three people share the same computer across shifts, each person must have a unique NDS® User object, and three licenses are needed.

7.16 Do I still need a server license?

A server license is still required. One server license can license unlimited OES NetWare servers in the same container or subcontainers. The same server license can be installed multiple times in the same eDirectory tree, but only once in a container.

7.17 What kind of user licenses are available?

Starting with OES NetWare, user license units consist of paper licenses you receive with each OES purchase. Novell no longer issues user license units for installation in eDirectory. For more information, see [Section 7.10, “What types of OES NetWare user licenses are available?” on page 50](#).

User licenses are sold in quantities of 5-, 10-, and 25-user license units.

Table 7-1 User License Packages

Purchased License	Contents
Server+5	1 5-unit license
Server+10	2 5-unit licenses
Server+25	5 5-unit licenses
Server+50	10 5-unit licenses
Server+100	20 5-unit licenses

7.18 Where should I place the license certificate in eDirectory?

NOTE: The information in this section only applies to NetWare installations prior to OES NetWare (NetWare 6.5 SP4). For OES NetWare instructions, see [Section 7.19, “Where should I place my MLA license certificate?” on page 52](#).

Because user licenses are consumed by User objects, they should be installed in an eDirectory container at or above the Users. NetWare searches for licenses upward in the tree from the user’s context. If a license is not found in the current user’s context, NLS searches upward in the tree to the organization level. Licenses cannot be installed into containers higher than an organization.

In NetWare 6.5 SP3 and earlier, users do not consume licenses from individual servers; therefore, it does not make sense for licenses to be tied to servers. User licenses must be installed into the users's context or a context which can be found on an upward search from the users's context.

NOTE: If a license is not found in the upward search, no search of the server's context is attempted. This prevents problems between different departments that manage their own licenses in configurations where users reside in departmental contexts but servers are installed in a central location.

7.19 Where should I place my MLA license certificate?

NOTE: The information in this section applies to all OES NetWare (NetWare 6.5 SP4) and later installations, and to anyone with an MLA license agreement. For earlier NetWare installations, see [Section 7.18, "Where should I place the license certificate in eDirectory?," on page 51.](#)

MLA licenses should be installed in or above the server's context. You can install MLA licenses as many times as you want, but in most cases you need install them only once in each tree, usually in the Organization (O) container.

During the server installation, if an MLA license is detected in a path accessible to the current installation, you are prompted to choose to install without a license or to select another context.

7.20 Does having an MLA license installed authorize unlimited user connections on my network?

No.

Unlimited user connections are authorized only if you have a Master License Agreement with Novell. This is different than merely installing the MLA license that comes standard with OES NetWare.

NetWare usage is always audited and is subject to whatever limitations are specified in the paper licenses associated with the NetWare purchase. For example, a 5-user Red Box™ (retail) license for OES NetWare authorizes up to 5 simultaneous user connections on the network. A Master License Agreement with Novell authorizes unlimited user connections.

MLA license certificates were originally given only to customers with Master License Agreements with Novell. However, to simplify license management, they are now used in all NetWare installations, starting with OES NetWare (NetWare 6.5 SP4).

MLA licenses contain a special server license that permits NLS to grant login requests without confirming that a user connection is available. No user licenses are included in MLA licenses.

7.21 How do I monitor license compliance with MLA licenses?

Use the NetWare Usage tool to check your user connections and ensure you are in compliance with your license agreement. See [Chapter 4, “Metering Network and Product Usage,”](#) on page 33 for more information.

7.22 How do I change from one license type to another?

If you need to switch from one license type like a Volume License Agreement (VLA) to a Master License Agreement (MLA), see [Section 2.11, “Changing License Types,”](#) on page 28.

7.23 Can I install user licenses during the OES NetWare server installation?

OES NetWare comes with an MLA license, which doesn't require or include user licenses. For more information, see [Section 1.1, “OES NetWare Includes MLA License Files,”](#) on page 11.

7.24 How do I add, view, and delete licenses?

You can manage licenses using Novell iManager. For more information, see [Chapter 2, “Managing Licensing and Certificates,”](#) on page 19.

NOTE: The licensing plug-in for iManager is incompatible with the Novell Browser found on the server.

7.25 Are NetWare 5.1 licenses compatible with OES NetWare?

NetWare 5.1 servers can coexist in the same eDirectory tree; however, you cannot use a NetWare 5.1 server license for an OES NetWare server.

7.26 How do I look at my installed licenses?

You can view information about the installed licenses using Novell iManager. For more information, see [“Chapter 2, “Managing Licensing and Certificates,”](#) on page 19.”

You can also use the `version` command at the server console. The `version` works with NetWare 6 Support Pack 1 or later. For more information, see [“Using the Version Console Command”](#) on page 25.

NOTE: The licensing plug-in for iManager is incompatible with the Novell Browser found on the server.

7.27 How can I monitor consumption of user licenses?

NetWare 6 includes a snap-in to Novell Remote Manager called NetWare Usage. Using NetWare Usage, you can view statistical information about license usage and generate reports.

In NetWare 6.5 and later, this functionality was moved to Novell iManager. See [Section 2.5, “Installing and Removing License Certificates,” on page 21](#) for more information.

7.28 After installing an OES NetWare server, I can log in only once or twice before failing to log in or map drives. Why?

Most likely licensing is not installed properly and you are consuming a grace login license.

The simplest solution is to install the MLA license (included in the `\LICENSE` folder on the NetWare installation media) in the Organization (O) container of your tree. For instructions on installing OES NetWare licenses, see [Chapter 2, “Managing Licensing and Certificates,” on page 19](#). NetWare allows up to 3 grace connections.

7.29 Why are my NetWare licenses expired?

The evaluation license included with OES 1 SP1 and later in the `\LICENSE` folder is limited to 90 days. If your license is expired, you need to delete the expired license and install a valid license. For more information, see [Section 2.5, “Installing and Removing License Certificates,” on page 21](#).

7.30 I replaced my expired licenses. Why am I still getting messages saying that my licenses are expired?

You must remove the expired licenses from eDirectory and install new licenses using Novell iManager (see [Section 2.5, “Installing and Removing License Certificates,” on page 21](#)). After you have removed the old licenses and installed the new ones, you must flush the NLS cache so that the server can consume the new license. There are three ways to flush the cache:

- ♦ Unload `polimgr` and `nls1sp`, then load `polimgr`.
- ♦ Wait 45 minutes to an hour for `polimgr.nlm` to update the cache.
- ♦ Restart the server.

7.31 Why can't I map a drive?

The most typical reason for mapping failures that relate to licensing are expired licenses. Refer to [Section 7.29, “Why are my NetWare licenses expired?,” on page 54](#).

7.32 Why can't I log in or map drives after replacing the Demo licenses?

Most likely, the Demo licenses were not fully removed. These licenses might be interfering with your installed licenses.

Using Novell iManager, ensure that the Demo licenses have been removed and valid licenses have been installed.

7.33 What files are on the license diskette?

Prior to OES NetWare (NetWare 6.5 SP4), the server license is contained in the `\LICENSE` directory of a license diskette. This is an `.nlf` file and is accompanied by a NICI key `.nfk` file. User licenses are stored in the root directory of each of these diskette. User license files are also `.nlf` files but do not have an accompanying NICI key. This arrangement, separation of server and user licenses, allows the server license to be installed during the server installation process without installing the User licenses, which are installed using Novell iManager.

7.34 How does NetWare handle license activation keys?

NetWare server licenses are free. As a result, every user license diskette contains a server license. Therefore, many customers have a number of extra server licenses not in use. Novell no longer licenses runtime servers. You may use as many NetWare servers as you require.

Because server licenses are distributed freely, the only activation key contained on upgrade license diskettes is for the user license component. As before, activation keys are distributed only with upgrade licenses.

When the server license on an upgrade license diskette is installed, either during the actual server installation or after server installation in Novell iManager, no activation screen is generated.

When the user license on this same disk is installed, a screen prompt appears requesting manual entry of the activation key, if required.

7.35 What tools are available to manage licensing in NetWare?

To manage licensing you can use Novell iManager. To view licensing information you can use Novell Remote Manager or the `version` console command.

The License Options menu is no longer supported by `nwconfig`, because user licenses are installed relative to users, not servers.

NOTE: The licensing plug-in for iManager is incompatible with the Novell Browser found on the server.

7.36 How can I see NLS errors? They don't display on the console.

Most Novell Licensing Service and Policy Manager error codes display only when trace facilities are turned on. Use any of the following commands to turn on the trace facilities:

Turn on NLSTRACE: SET NLSTRACE = 2

Turn off NLSTRACE and write SYS:SYSTEM\NLSTRACE.OLD: SET NLSTRACE=0

Turn on PMTRACE: PM TRACE FILE ON

Turn off PMTRACE and write SYS:SYSTEM\PMTRACE.DBG: PM TRACE FILE OFF

7.37 Where can I see a list of NLS error codes?

A list of error codes is available in *OES2 SP1: System Messages for NetWare* and in the January 2001 *NetWare Application Notes* entitled [How to Optimize Novell Licensing Services](http://support.novell.com/techcenter/articles/ana20010102.html) (<http://support.novell.com/techcenter/articles/ana20010102.html>).

7.38 How can I learn more about Novell Licensing Services?

The following Novell articles and documents provide additional information:

- ♦ [How to Optimize Novell Licensing Services](http://support.novell.com/techcenter/articles/ana20010102.html) (<http://support.novell.com/techcenter/articles/ana20010102.html>) (January 2001 *NetWare Application Notes*)
- ♦ [Important Information Regarding Changes to Licensing for NetWare 6](http://support.novell.com/cgi-bin/search/searchtid.cgi?/10065536.htm) (<http://support.novell.com/cgi-bin/search/searchtid.cgi?/10065536.htm>)
- ♦ [Troubleshooting Downloaded Licenses from Shop Novell](http://support.novell.com/cgi-bin/search/searchtid.cgi?/10062967.htm) (<http://support.novell.com/cgi-bin/search/searchtid.cgi?/10062967.htm>)
- ♦ [Troubleshooting NetWare 6 Novell Licensing Services](http://support.novell.com/cgi-bin/search/searchtid.cgi?/10066215.htm) (<http://support.novell.com/cgi-bin/search/searchtid.cgi?/10066215.htm>)
- ♦ [Troubleshooting Licenses in a NetWare 5.1 and NetWare 6 Environment](http://support.novell.com/cgi-bin/search/searchtid.cgi?/10065604.htm) (<http://support.novell.com/cgi-bin/search/searchtid.cgi?/10065604.htm>)

Documentation Updates



This section summarizes the changes made to this manual since the initial release of Novell® Open Enterprise Server 2.

October 24, 2008

Chapter or Section Changed	Summary of Changes
Chapter 4, "Metering Network and Product Usage," on page 33	Removed section on running Audit reports. The feature is no longer available.

February 22, 2008

Chapter or Section Changed	Summary of Changes
Various	Added information about Licensing changes introduced with OES 2.