

NetWare® Installation Guide

Novell® Open Enterprise Server

2 SP1

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About This Guide

This guide describes how to install and upgrade Novell® Open Enterprise Server 2 (OES 2) for the NetWare® 6.5 platform. Except where specifically stated, the content of this guide applies to installing OES 2 SP1 NetWare on a computer's physical hardware rather than on a Xen* virtual machine host server.

This guide is divided into the following sections:

- ♦ Chapter 1, "What's New in OES 2 SP1 NetWare," on page 13
- ♦ Chapter 2, "Preparing to Install OES 2 SP1 NetWare," on page 15
- ♦ Chapter 3, "Upgrading to OES 2 SP1 NetWare," on page 33
- ♦ Chapter 4, "Installing OES 2 SP1 NetWare (Physical)," on page 37
- ♦ Chapter 5, "Installing and Managing OES 2 SP1 NetWare on a Xen-based VM Host Server," on page 81
- ♦ Chapter 7, "Security Considerations," on page 97
- ♦ Appendix A, "NetWare Response File Reference," on page 99
- ♦ Appendix B, "Install Command Line Options," on page 181
- ♦ Appendix C, "Upgrading to NetWare 6.5 SP6," on page 183
- ♦ Appendix E, "Installing OES NetWare on VMware," on page 197

Audience

This guide is intended for network installers and system administrators.

Feedback

We want to hear your comments and suggestions about this manual and the other documentation included with OES. Please use the User Comments feature at the bottom of each page of the online documentation, or go to [Novell Feedback \(http://www.novell.com/documentation/feedback.html\)](http://www.novell.com/documentation/feedback.html) and enter your comments there.

Documentation Updates

The latest version of the *OES 2: NetWare Installation Guide* is available at the [Open Enterprise Server 2 documentation Web site \(http://www.novell.com/documentation/oes2\)](http://www.novell.com/documentation/oes2).

Additional Documentation

Table 1 *Additional Documentation References*

For more information about	See
Planning and implementing OES 2 for NetWare	<i>OES 2 SP1: Planning and Implementation Guide</i>

For more information about	See
Migrating NetWare data and services to OES 2 Linux	<i>OES 2 SP1: Migration Tool Administration Guide</i>
Installing OES 2 SP1 NetWare on a Xen Virtual Host Server	"Chapter 5, "Installing and Managing OES 2 SP1 NetWare on a Xen-based VM Host Server," on page 81"
NetWare operating system administration details	<i>OES2 SP1: Server Operating System for NetWare Administration Guide</i>
NetWare commands and utilities	<i>OES 2 SP1: Utilities Reference for NetWare</i>

For additional information about OES 2 SP1 NetWare and other Novell products and services, see the following areas of the Novell Web site:

- ♦ [Open Enterprise Server Migration Page \(http://www.novell.com/products/openenterpriseserver/migrate.html\)](http://www.novell.com/products/openenterpriseserver/migrate.html)
- ♦ [Open Enterprise Server Product Page \(http://www.novell.com/products/openenterpriseserver/\)](http://www.novell.com/products/openenterpriseserver/)
- ♦ [Novell Open Enterprise Server Cool Solutions \(http://www.novell.com/coolsolutions/oes\)](http://www.novell.com/coolsolutions/oes)
- ♦ [Novell Technical Services \(http://www.novell.com/support\)](http://www.novell.com/support)
- ♦ [Novell Global Training Services \(http://www.novell.com/training\)](http://www.novell.com/training)
- ♦ [Novell Partners and Developers \(http://www.novell.com/partners\)](http://www.novell.com/partners)

If you want to install OES 2 on the Linux^{*} platform, see the *OES 2 SP1: Linux Installation Guide*.

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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 forward slashes to reflect the Linux^{*} convention. Users of platforms that require a backslash, such as NetWare, should use backslashes as required by your software.

What's New in OES 2 SP1 NetWare

1

This section outlines the installation and upgrade features that were updated in Novell® Open Enterprise Server (OES) 2 for NetWare® 6.5 in its initial release and after.

- ♦ [Section 1.1, “OES 2 SP1,” on page 13](#)
- ♦ [Section 1.2, “OES 2 Initial Release,” on page 13](#)

1.1 OES 2 SP1

OES 2 SP1 includes the following changes:

Table 1-1 OES 2 SP1

Functionality	For More Information
eDirectory™ support	If you are upgrading your server, the upgrade path depends on the version that is currently running. If the server is running eDirectory 8.7.3 SP9, it will be upgraded to 8.7.3 SP10. If it is running 8.8.2, it will be upgraded to 8.8.4. For new servers, eDirectory 8.8.4 is installed.

1.2 OES 2 Initial Release

In this release of OES 2 SP1 NetWare (NetWare 6.5 SP8), the following features have been added to the NetWare installation:

Table 1-2 OES 2 Initial Release

Functionality	For More Information
DVD media is now also available to perform the installation.	For information about the media to download for installation, see Section 2.2.2, “Preparing the NetWare Installation Software,” on page 20 .
You can install OES 2 NetWare as a guest operating system on a Xen virtual machine host server.	For information about Installing OES 2 NetWare as a guest operating system, see Chapter 5, “Installing and Managing OES 2 SP1 NetWare on a Xen-based VM Host Server,” on page 81 .
In-place and remote upgrades of NetWare servers are no longer supported.	For information about Installation and upgrade options, see Section 2.1, “Understanding the Install/Upgrade Options,” on page 15 .
A new NetWare response file creation tool is available in YaST on all OES 2 Linux servers.	For information about using the NetWare Response File Utility in YaST, see Section A.3, “Using the NetWare Response File Utility in YaST,” on page 105 .

To become familiar with the general features and functionality that are new in the initial release of OES 2, see the following online documents:

- ♦ *OES 2: Readme* (http://www.novell.com/documentation/oes2/oes_readme/data/oes_readme.html)
- ♦ *Novell Open Enterprise Server 2 Sneak Peek* (<http://www.novell.com/products/openenterpriseserver/sneakpeek.html>)
- ♦ “The Wait Is Over: Highlights of Novell Open Enterprise Server 2” in *Novell Connection, September 2007* (http://www.novell.com/connectionmagazine/2007/09/tech_talk_1.html?sourceid=NCM_09_07_tt1)

Preparing to Install OES 2 SP1 NetWare

2

Before you install or upgrade to Novell® Open Enterprise Server 2 (OES 2) for NetWare®, you should review this installation guide and the information in the following guides:

- ♦ *OES 2 SP1: Planning and Implementation Guide*
- ♦ *OES 2 SP1: Migration Tool Administration Guide*
- ♦ *OES 2 SP1: Readme* (http://www.novell.com/documentation/oes2/oes_readme/data/readme.html)

You should also read and perform the tasks outlined in these sections:

- ♦ Section 2.1, “Understanding the Install/Upgrade Options,” on page 15
- ♦ Section 2.2, “Meeting Hardware and Software Requirements,” on page 19
- ♦ Section 2.3, “Planning Your OES Deployment,” on page 20
- ♦ Section 2.4, “Preparing the Network,” on page 23
- ♦ Section 2.5, “Using Deployment Manager,” on page 26
- ♦ Section 2.6, “What’s Next,” on page 31

2.1 Understanding the Install/Upgrade Options

The NetWare server platform for OES 2 SP1 is NetWare 6.5 Support Pack 8. For ease of reference, this guide uses the terms “OES 2 SP1 NetWare” and “OES 2 SP1 NetWare” to mean Open Enterprise Server 2 running on the NetWare 6.5 SP8 platform.

- ♦ Section 2.1.1, “NetWare Server Installation: Physical and Virtualized,” on page 15
- ♦ Section 2.1.2, “NetWare Server Upgrades,” on page 16
- ♦ Section 2.1.3, “OES NetWare Deployment Options,” on page 16
- ♦ Section 2.1.4, “Server Migration Tools,” on page 17
- ♦ Section 2.1.5, “Product-Specific Notes,” on page 17

2.1.1 NetWare Server Installation: Physical and Virtualized

Novell does not distinguish between a NetWare 6.5 Support Pack installation and the OES NetWare installation. NetWare 6.5 SP8 and OES 2 SP1 on NetWare use the same installation program and media.

In a non-virtualized environment, installing OES 2 SP1 NetWare is the same as installing NetWare 6.5 with Support Pack 8.

OES 2 SP1 NetWare introduces support for installing NetWare as a guest operating system on a Xen virtual machine host server. Virtualized OES 2 SP1 NetWare runs in paravirtual mode, which means the operating system has been modified to take advantage of the virtualization environment. Typically, operating systems running in paravirtual mode enjoy better performance than those requiring full virtualization mode.

The procedure for installing virtualized OES 2 SP1 NetWare also uses the NetWare 6.5 SP8 installation program and media, but additional setup steps are necessary to prepare the Xen host server and to create a virtual machine. For more information, see the [Virtualization with Xen \(http://www.novell.com/documentation/sles10/xen_admin/data/cha_xen_virtualization_vhost_setup.html\)](http://www.novell.com/documentation/sles10/xen_admin/data/cha_xen_virtualization_vhost_setup.html) guide.

2.1.2 NetWare Server Upgrades

In OES 2 SP1 NetWare, in-place and remote server upgrades are no longer supported. To upgrade from NetWare 6.5 SP6 to OES 2 SP1 NetWare, you must perform a support pack update. This update requires Support Pack 8 for NetWare 6.5, which you can download from the [Novell Patches Web site \(http://support.novell.com/patches.html\)](http://support.novell.com/patches.html). For more information, see [Chapter 3, “Upgrading to OES 2 SP1 NetWare,” on page 33](#).

NOTE: In-place upgrades from any version of physical NetWare to virtualized OES 2 SP1 NetWare are not supported in the initial release of OES 2.

2.1.3 OES NetWare Deployment Options

The options for installing and updating OES 2 SP1 NetWare servers are summarized in [Table 2-1](#).

Table 2-1 OES 2 SP1 NetWare Server Deployment Options

Install/Upgrade Option	When to Use	Documentation
Upgrade of an existing NetWare server to OES 2 SP1 NetWare	You have an existing NetWare 5 or later server and you want to upgrade it to OES 2 SP1 NetWare locally from the server itself, or remotely from a workstation.	Local and remote upgrades are not supported in OES 2 SP1 NetWare. Use the Support Pack script (see Chapter 3, “Upgrading to OES 2 SP1 NetWare,” on page 33).
Update of an existing NetWare server to OES 2 SP1 NetWare	You have an existing NetWare 5 or later server and you want to update it to OES 2 SP1 NetWare by using the Support Pack script.	Chapter 3, “Upgrading to OES 2 SP1 NetWare,” on page 33
New installation of OES 2 SP1 NetWare	You have new server-class PC hardware and you want to install physical NetWare on it for the first time.	Chapter 4, “Installing OES 2 SP1 NetWare (Physical),” on page 37
New installation of virtualized OES 2 SP1 NetWare (on a Xen virtual machine)	You have a SUSE® Linux Enterprise Server 10 SP1 server running as a Xen host server and you want to install OES 2 SP1 NetWare on it as a guest operating system	Chapter 5, “Installing and Managing OES 2 SP1 NetWare on a Xen-based VM Host Server,” on page 81

Install/Upgrade Option	When to Use	Documentation
Unattended installation of OES 2 SP1 NetWare	You want to run an unattended or “silent” installation of NetWare with a response file.	Appendix A, “NetWare Response File Reference,” on page 99
New installation of OES 2 SP1 NetWare on a VMware virtual machine	You have a VMware* host server and you want to install OES 2 SP1 NetWare on it as a guest operating system.	Appendix E, “Installing OES NetWare on VMware,” on page 197

2.1.4 Server Migration Tools

Novell also offers server migration and consolidation tools to assist you in moving valuable data from older servers to new OES servers. For more information, see:

- ♦ [OES 2 SP1: Migration Tool Administration Guide](#)
- ♦ [Novell Server Consolidation and Migration Toolkit Administration Guide](#)

2.1.5 Product-Specific Notes

As you deploy NetWare 6.5 SP8 with various add-on products and services, you should be aware of the product-specific issues described in this section.

- ♦ [“Novell” on page 17](#)
- ♦ [“Novell iManager” on page 17](#)
- ♦ [“Virtual Office” on page 18](#)
- ♦ [“QuickFinder Server” on page 18](#)
- ♦ [“Recommended Method of Updating Installed Products” on page 18](#)
- ♦ [“Removed Products” on page 18](#)

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By default, the version of eDirectory™ installed on new OES 2 SP1 NetWare (NetWare 6.5 SP8) servers is eDirectory 8.8.4.

When you update an existing NetWare 6.5 SP6 or earlier server to NetWare 6.5 SP8 by using the Support Pack script, the version of eDirectory remains at 8.7.3. After updating the server, you can upgrade to eDirectory 8.8.4 by following the instructions in [“Migrating to eDirectory 8.8 SP4”](#) in the [Novell eDirectory 8.8 Installation Guide](#).

Novell iManager

When you install a new NetWare 6.5 SP8 server and choose to install Novell iManager, the version installed is iManager 2.7.2. This is the latest cross-platform version of iManager, which allows you to manage both OES NetWare and OES Linux servers.

If you are updating an existing NetWare 6.5 server to SP8 and the server has iManager 2.5 or 2.6 installed, the version is automatically updated to iManager 2.7.2.

If you are updating an existing NetWare 6.5 server to SP8 and the server has iManager 2.0.2 installed, the version of iManager is not updated. This preserves the user password self-management capability for Virtual Office 1.0.

If you want to upgrade iManager 2.0.2 to iManager 2.7.2, do a product install of iManager 2.7.2 using the NetWare 6.5 SP8 overlay CDs *after* you have applied the SP8 update in NWCONFIG.

Virtual Office

Virtual Office is included as part of NetWare 6.5 SP8.

Starting in NetWare 6.5 SP4, the administration interface for Virtual Office was removed from iManager and incorporated into Virtual Office 1.5 and later. You can install Virtual Office 1.5 or 1.6 on a NetWare 6.5 SP3 (non-OES) server. However, if you are still using iManager 2.0.2, the Virtual Office plug-ins are disabled. When you upgrade a previous installation of Virtual Office to Virtual Office 1.5 or 1.6, the Virtual Office install migrates configuration settings for virtual teams and other services. Bookmarks are not migrated. For more information, see the [Novell Open Enterprise Server Virtual Office Configuration Guide](http://www.novell.com/documentation/oes/virtualoffice/data/bktitle.html#bktitle) (<http://www.novell.com/documentation/oes/virtualoffice/data/bktitle.html#bktitle>).

QuickFinder Server

The Novell QuickFinder™ Server replaces the NetWare Web Search Server. QuickFinder Server is a Web and file system search engine that includes several new and enhanced features. If you install QuickFinder Server on an existing NetWare server with Web Search Server installed, the QuickFinder install recognizes the older installation and migrates the configuration settings and indexes that QuickFinder uses. However, you must regenerate the old indexes before they can be searched. For more information, see the *OES 2: Novell QuickFinder Server 5.0 Administration Guide*.

Recommended Method of Updating Installed Products

If you are upgrading from NetWare 6.5 FCS or later, Novell recommends that you run NWCONFIG and use Product Options to apply the SP8 updates from the update CD. This method upgrades QuickFinder to the current version. It also detects the version of iManager and applies either iManager 2.0.2 or iManager 2.7 updates as required.

For more information, see [Section 4.25.5, “Installing Product Updates,” on page 78](#).

Removed Products

The following components have been removed from the NetWare 6.5 product and can no longer be selected for installation in NetWare 6.5 SP8:

- ♦ Novell Nsure® Audit Starter Pack Server (removed in NetWare 6.5 SP6)

The pattern install for Novell Nsure Audit Starter Pack Server has been removed.

- ♦ Novell Nterprise™ Branch Office Rsync Server (removed in NetWare 6.5 SP4)

The pattern install for the Nterprise Branch Office - Central Office Server has been removed. You can upgrade an existing NBO Central Office Server, but you cannot install a new one.

- ♦ Novell Nsure UDDI Server (removed in NetWare 6.5 SP4)

In previous versions of NetWare 6.5, this component was installed with the exteNd™ J2EE Web Application Server, Apache*/Tomcat Server, and Novell Nsure Audit Starter Pack Server patterns. Only the UDDI Server component has been removed; the three server patterns remain available except in NetWare 6.5 SP6 and later, in which the Nsure Audit Server pattern has been removed.

Unless otherwise noted, all other previously available products and functionality of NetWare 6.5 continue to be available in OES 2 SP1 NetWare.

2.2 Meeting Hardware and Software Requirements

OES 2 SP1 NetWare runs on server hardware that has been approved by the manufacturer for running the NetWare 6.5 operating system. For more information on system specifications, contact the hardware manufacturer.

- ♦ [Section 2.2.1, “Meeting System Requirements,” on page 19](#)
- ♦ [Section 2.2.2, “Preparing the NetWare Installation Software,” on page 20](#)

2.2.1 Meeting System Requirements

NetWare 6.5 runs on the minimum system requirements listed below. For optimal performance, the computer should meet the recommended requirements.

Minimum System Requirements

NetWare 6.5 has the following minimum system requirements:

- ☐ A server-class PC with a Pentium* II or AMD* K7 processor
- ☐ 512 MB of RAM
- ☐ A Super VGA display adapter
- ☐ A DOS partition of at least 200 MB and 200 MB available space
- ☐ 1 GB of available, unpartitioned disk space outside the DOS partition for volume sys:
- ☐ One network board
- ☐ A bootable CD drive that supports the El Torito specification

Recommended System Requirements

For optimal performance, NetWare 6.5 has the following recommended system requirements:

- ☐ A server-class PC with two-way Pentium III, Pentium III Xeon*, Pentium 4, or Intel* Xeon 700 MHz or higher processors
- ☐ 1 GB of RAM

Some OES NetWare installation options (patterned deployments) have specific processor and RAM requirements. See [Section 4.6, “Choosing a Server Pattern,” on page 46](#) for individual pattern requirements.

- ☐ A VESA 1.2-compliant, high resolution display adapter
- ☐ A boot partition with 1 GB of available space

To determine the optimal size of a boot partition, add the amount of server memory to the minimum amount of the available disk space. The minimum amount of available space is 200 MB, so a server with 1024 MB RAM has an optimal boot partition of 1224 MB (1024 MB + 200 MB = 1224 MB). This size allows you to do a core dump to the disk drive if required.

- ☐ 8 GB of available, unpartitioned disk space outside the boot partition for volume sys:
- ☐ One or more network boards
- ☐ A bootable CD drive that supports the El Torito specification
- ☐ A USB or PS/2* mouse for navigating the NetWare server's graphical user interface

2.2.2 Preparing the NetWare Installation Software

The installation procedures described in this manual assume you are installing OES 2 SP1 NetWare, which is the same as NetWare 6.5 SP8.

You should download the NetWare 6.5 SP8 Operating System and Products CD overlay ISO images and burn them to CDs for use when installing or upgrading to OES NetWare. Alternatively, you can download the NetWare 6.5 SP8 DVD overlay ISO image and burn it to DVD. This eliminates swapping CDs in the middle of the server installation when you are installing from physical media.

Use third-party CD/DVD burning software to create the CDs or DVD from the ISO images you download.

Label your NetWare installation CDs or DVD as shown in [Table 2-2](#).

Table 2-2 OES 2 SP1 NetWare Installation CD/DVD Labels

ISO Image	Label
NW65OSSP8.iso	NetWare 6.5 SP8 CD 1 (Operating System)
NW65PRODSP8.iso	NetWare 6.5 SP8 CD 2 (Products)
NW65SP8_OVL_DVD.iso	NetWare 6.5 Support Pack 8 DVD

For more information on downloading these image files, see the [Novell Open Enterprise Server 2 Download Instructions](http://www.novell.com/documentation/oes2/esd/di_oes2.html) (http://www.novell.com/documentation/oes2/esd/di_oes2.html).

2.3 Planning Your OES Deployment

The information you need to gather and basic decisions you need to make before installing OES 2 SP1 NetWare are outlined below.

- ♦ [Section 2.3.1, “Determine What Services to Install,” on page 21](#)
- ♦ [Section 2.3.2, “Plan Your eDirectory Tree,” on page 21](#)
- ♦ [Section 2.3.3, “Rights Required for Installing OES NetWare Servers,” on page 22](#)
- ♦ [Section 2.3.4, “Gather Server Hardware and IP Address Information,” on page 23](#)

For detailed help in planning your OES deployment, see “[Planning Your OES 2 Implementation](#)” in the *OES 2 SP1: Planning and Implementation Guide*.

2.3.1 Determine What Services to Install

Novell networking services delivered as part of OES 2 include the following:

- ♦ Directory services and identity management, including Novell eDirectory and Novell Identity Manager
- ♦ File services, including Novell Storage Services™ (NSS) and Novell iFolder®
- ♦ Print services, including Novell iPrint
- ♦ Collaboration services, including Virtual Office
- ♦ Open source services, including Apache, Tomcat, MySQL*, and PHP/Perl
- ♦ Software distribution and patch management services including Red Hat* Package Manager (RPM) and Red Carpet® Daemon (RCD)
- ♦ Management consoles and interfaces common to all services through Novell iManager

The services you choose to install depend largely on the intended purpose of your OES server.

To simplify the process of installing special-purpose servers, Novell provides a patterned deployment feature. For example, if you want to install an OES 2 server with all of the components necessary to host open source Web database applications, you simply select the NetWare AMP (Apache, MySQL, PHP, and Perl) Server pattern during the OES installation.

You should choose a pattern installation if one exists for the intended purpose of your server. Options are also provided to install basic and customized servers.

2.3.2 Plan Your eDirectory Tree

If you are creating a new eDirectory tree on your network, you must do some additional planning before you install the first server into the tree.

IMPORTANT: Installation of NetWare versions earlier than OES NetWare (NetWare 6.5 SP4) into an OES Linux tree should not be attempted. In particular, Novell does not support installing a new NetWare 5.1 server into an OES Linux tree.

The first server you install into a new eDirectory tree is important for two reasons: first, you create the basic structure of the tree during the server installation; second, this server permanently hosts the Certificate Authority for your organization.

To ensure that your eDirectory tree meets your needs, take time to plan the following:

- ♦ **Structure of the eDirectory tree:** A well-designed tree provides containers for servers, users, printers, etc. It is also optimized for efficient data transfer between geographically dispersed locations.
- ♦ **Partitions and replicas:** eDirectory allows the tree to be partitioned for scalability. Replicas (copies) of the partitions provide fault tolerance within the tree. The first three servers installed into an eDirectory tree automatically receive replicas of the tree's root partition. You might want to create additional partitions and replicas.
- ♦ **Time synchronization:** eDirectory requires that all OES servers, both NetWare and Linux, be time synchronized. By default, the OES for NetWare installation synchronizes time automatically with the first server in the tree. However, you might want to synchronize with an external time source using Network Time Protocol (NTP).

For more information on eDirectory tree planning, see the *Novell eDirectory 8.8 Administration Guide*.

For more information on time synchronization with NTP, see the *OES 2: Novell NTP for NetWare Administration Guide*.

2.3.3 Rights Required for Installing OES NetWare Servers

The rights required to install a NetWare server vary depending on whether you use the Admin user account created during the Install program or set up separate user accounts as subcontainer administrators.

- ♦ “Rights Required to Install the First Server” on page 22
- ♦ “Rights Required for Subcontainer Administrators” on page 22

Rights Required to Install the First Server

To install the first OES NetWare server in an eDirectory tree, the user who installs the server must have the Supervisor right at the [Root] of the eDirectory tree. If you are installing the server into a new tree, the Admin user that is created during the OES NetWare Install program has full rights to the root of the tree. Using the Admin account allows the installer to extend the eDirectory schema for OES NetWare as necessary.

If you are installing the first OES NetWare server into an existing NDS[®]/eDirectory tree, be sure to run the Novell Deployment Manager first to prepare the tree so it is compatible with the version of eDirectory that comes with OES. This requires access to a server with a Read/Write replica of the Root partition. See [Section 2.5, “Using Deployment Manager,” on page 26](#) for more information.

Rights Required for Subcontainer Administrators

For security reasons, you might want to create one or more subcontainer administrators with sufficient rights to install additional OES NetWare servers, without granting them full rights to the entire tree. A subcontainer administrator needs the following rights to install an OES NetWare server into the tree:

- ☐ Supervisor right to the container where the server is to be installed
- ☐ Read right to the Security container object for the eDirectory tree
- ☐ Read right to the NDSPKI:Private Key Attribute on the Organizational CA object (which is located in the Security container)
- ☐ Supervisor right to the W0 object (located inside the KAP object in the Security container)

These rights are typically granted by placing all administrative users in a Group or Role, and then assigning the above rights to the Group or Role.

Many of the products that can be selected to install along with OES NetWare require schema extensions of their own. Only an administrator with rights at [Root] can extend the schema of an eDirectory tree; a subcontainer administrator does not have sufficient rights. One way to work around this is to have a root administrator install an OES NetWare server with all products selected. This takes care of extending the schema for every possible server configuration. Subcontainer administrators can then install subsequent OES NetWare servers without worrying about schema extensions.

Another option is to complete the Schema Update task in Deployment Manager. This task prompts you to select an NDS/eDirectory tree and then gives you the opportunity to select the products you plan to install on servers in that tree. After you have confirmed your product selections, Deployment Manager updates eDirectory with required and product schema extensions.

To synchronize the schema updates on other trees, run the DSTrace utility as described in [TID 10066604](http://support.novell.com/cgi-bin/search/searchtid.cgi?/10066604.htm) (<http://support.novell.com/cgi-bin/search/searchtid.cgi?/10066604.htm>).

By default, the first three servers installed in an eDirectory partition automatically receive a replica of the partition. To install a server into a partition that does not already contain three replica servers, the user must have either the Supervisor right at the [Root] of the tree or administrative rights to the container in which the server holding the partition resides.

Novell recommends that you install the first OES server in a tree as the Admin user with rights to [Root]. Your ability to install the first OES server as a subcontainer admin depends on the existing eDirectory environment. In a NetWare 5 or 6.0 tree, you might need to give the subcontainer admin the Supervisor right to the Security container so that new Novell Modular Authentication Services (NMAST™) functionality can be installed for the first time. All core and product-specific schema extensions must have already been performed.

If existing eDirectory objects need to be modified that are outside the context where the subcontainer admin has rights, you must grant the subcontainer admin the necessary rights to those objects as well.

2.3.4 Gather Server Hardware and IP Address Information

The NetWare installation program can automatically detect many network boards and disk storage devices and load the appropriate drivers. If you have hardware drivers that are not included in NetWare, you need to know the device properties, such as the interrupt and port address. For more information, contact the server hardware manufacturer.

If you plan to connect your server to the Internet using the Internet Protocol (IP), you need the following configuration information:

- ♦ An IP address, subnet mask, and router (gateway) address
- ♦ The IP address of one or more domain name servers
- ♦ The name of your domain name system (DNS) domain

To obtain this information, consult your network administrator or Internet service provider (ISP).

2.4 Preparing the Network

Depending on your NetWare and NDS/eDirectory versions, certain preparations might be needed before you can install the first OES NetWare server into an existing network.

NOTE: It is strongly recommended that you upgrade all NetWare servers to the latest supported versions of NetWare and deploy the current version of eDirectory as soon as possible. Compatibility between OES NetWare and previous versions of NetWare and NDS/eDirectory is provided as an interim solution only.

- ♦ [Section 2.4.1, “Preparing a NetWare 6.5 Network,” on page 24](#)
- ♦ [Section 2.4.2, “Preparing a NetWare 6.0 Network,” on page 24](#)

- ♦ [Section 2.4.3, “Preparing a NetWare 5.1 Network,” on page 24](#)
- ♦ [Section 2.4.4, “Preparing a NetWare 4.x Network,” on page 25](#)

2.4.1 Preparing a NetWare 6.5 Network

If you have an eDirectory tree that already contains at least one NetWare 6.5 server, most of the preparatory tasks necessary for OES NetWare have already been completed.

Depending on the eDirectory version in the existing tree, you might need to apply some updates and schema extensions to prepare the tree for the version of eDirectory that comes with OES. See [“Prepare for New eDirectory” on page 28](#) for more information.

2.4.2 Preparing a NetWare 6.0 Network

NetWare 6.0 is no longer supported by Novell. See the [Novell Support Lifecycle Web site \(http://support.novell.com/lifecycle\)](http://support.novell.com/lifecycle).

Upgrading NetWare 6.0 servers to OES NetWare is not supported in OES 2. If you have NetWare 6.0 servers, you should plan to migrate them to OES NetWare as quickly as possible. You have the following options:

- ♦ Use the NetWare Migration Wizard from the Server Consolidation and Migration Toolkit to migrate a NetWare 6.0 server onto new hardware running OES NetWare. As part of the migration, the old server is shut down and the new server assumes the server name and IP address of the old server.

For instructions on running Migration Wizard, see the [Novell Server Consolidation and Migration Toolkit Administration Guide](#).

- ♦ Use the Novell Server Consolidation Utility from the Server Consolidation and Migration Toolkit to copy data from NetWare 6.0 servers onto new OES NetWare or Linux servers. The old servers remain active and retain their server names and IP addresses.

Verify that users can access the migrated data on your new OES NetWare servers, then remove the NetWare 6.0 source servers from the tree.

For instructions on running the Server Consolidation Utility, see the [Novell Server Consolidation and Migration Toolkit Administration Guide](#).

If your OES network uses NTPv3 for time synchronization, convert the time synchronization method on your migrated NetWare servers from `timesync.nlm` to NTPv3. For more information, see [“Migrating Timesync Servers to NTP” in the OES 2: Novell NTP for NetWare Administration Guide](#).

2.4.3 Preparing a NetWare 5.1 Network

If you have a NetWare 5.1 tree with NDS version 7.x or 8.x, follow these steps to prepare the network before installing the first OES server into the tree.

NOTE: Although you can install OES NetWare servers into NetWare 5.1 trees running NDS 7.62c or 8.85c, installing into a tree with a version earlier than eDirectory 8.7.x can make User objects unmanageable for management utilities other than those that ship with OES NetWare.

- 1 To ensure that licensing works properly, all NetWare 5.1 servers must have Support Pack 8 applied.

You can download NetWare Support Packs from the *Novell Downloads page* (<http://www.novell.com/download>).

- 2 Verify that your NetWare 5.1 servers are running NDS version 7.62c or 8.85c.
- 3 In Deployment Manager, complete the Prepare for New eDirectory task to extend the core schema for compatibility with the version of eDirectory that ships with OES.

For more information, see “*Prepare for New eDirectory*” on page 28.

- 4 To ensure that your tree’s keys and certificates are not broken, run PKIdiag on any servers being upgraded and make sure that the certificates are good. Also, run SDIdiag and fix any tree key issues.

IMPORTANT: Make sure that you run PKIdiag and SDIdiag *after* you have applied Support Pack 8 to your NetWare 5.1 servers.

If you prefer to upgrade your NetWare 5.1 servers to OES 2 SP1 NetWare, see *Chapter 3*, “*Upgrading to OES 2 SP1 NetWare*,” on page 33.

2.4.4 Preparing a NetWare 4.x Network

NetWare 4.x is no longer supported by Novell. See the *Novell Support Lifecycle Web site* (<http://support.novell.com/lifecycle>).

Upgrading NetWare 4.x servers to OES NetWare is not supported in OES 2. If you have NetWare 4 servers, you should plan to migrate them to OES NetWare as quickly as possible. You have the following options for NetWare 4 servers:

- ♦ Use the NetWare Migration Wizard from the Server Consolidation and Migration Toolkit to migrate a NetWare 4 server onto new hardware running OES NetWare. As part of the migration, the old server is shut down and the new server assumes the server name and IP address of the old server.

For instructions on running the Migration Wizard, see the *Novell Server Consolidation and Migration Toolkit Administration Guide*.

- ♦ Use the Novell Server Consolidation Utility from the Server Consolidation and Migration Toolkit to copy data from NetWare 4 servers onto new OES NetWare or Linux servers. The old servers remain active and retain their server names and IP addresses.

Verify that users can access the migrated data on your new OES NetWare servers, then remove the NetWare 4 source servers from the tree.

For instructions on running the Server Consolidation Utility, see the *Novell Server Consolidation and Migration Toolkit Administration Guide*.

- ♦ Perform a down-server upgrade of NetWare 4.2 servers to OES NetWare.

Down-server upgrades are no longer officially supported by Novell. However, in certain situations, customers can work with Novell Support staff to complete a down-server upgrade. Contact [Novell Support \(http://support.novell.com\)](http://support.novell.com) for assistance.

If your OES network uses NTPv3 for time synchronization, convert the time synchronization method on your migrated NetWare servers from `timesync.nlm` to NTPv3. For more information, see “[Migrating Timesync Servers to NTP](#)” in the *OES 2: Novell NTP for NetWare Administration Guide*.

2.5 Using Deployment Manager

Deployment Manager is a set of utilities to help you prepare for a new installation of, or upgrade to, Novell Open Enterprise Server. It also contains documentation and hints to ensure the success of your installation or upgrade.

Before you introduce an OES NetWare server into an existing network, whether through a new installation or by upgrading an older server, you should run the Novell Deployment Manager to ensure that your network is properly prepared.

NOTE: If you already have an OES NetWare or NetWare 6.5 server in your tree, you do not need to run Deployment Manager.

- ♦ [Section 2.5.1, “Starting Deployment Manager,” on page 27](#)
- ♦ [Section 2.5.2, “Required Deployment Manager Tasks,” on page 27](#)
- ♦ [Section 2.5.3, “Network Preparation,” on page 28](#)
- ♦ [Section 2.5.4, “Install/Migration Options,” on page 30](#)
- ♦ [Section 2.5.5, “Post-Install Tasks,” on page 30](#)
- ♦ [Section 2.5.6, “Exiting Deployment Manager,” on page 31](#)

Deployment Manager provides easy access to a number of tasks you might need to perform as you prepare your network for server installations or upgrades. It also provides a consolidated interface to various install/upgrade and post-install tasks. Accordingly, the Deployment Manager tasks are divided into four sections: Required Tasks, Network Preparation, Install/Upgrade Options, and Post-Install Tasks.

Required Tasks

- ♦ [“For OES NetWare and NetWare 6.5 Servers” on page 27](#)
- ♦ [“For OES Linux Servers” on page 28](#)

Network Preparation tasks:

- ♦ [“Prepare for New eDirectory” on page 28](#)
- ♦ [“Update Certificate Authority Objects” on page 28](#)
- ♦ [“Prepare for Universal Password” on page 29](#)
- ♦ [“Prepare for CIFS/AFP” on page 29](#)
- ♦ [“Verify NICI Keys” on page 29](#)
- ♦ [“Schema Update” on page 29](#)

Install/Upgrade Options tasks:

- ♦ “Install NetWare 6.5” on page 30
- ♦ “Automate an Installation” on page 30
- ♦ “Consolidate or Migrate Servers” on page 30

Post-Install tasks:

- ♦ “Create Additional Volumes” on page 31
- ♦ “Install NetWare 6.5 Products” on page 31
- ♦ “Use DSREPAIR” on page 31
- ♦ “Remove Deployment Manager” on page 31

2.5.1 Starting Deployment Manager

You run Deployment Manager from a Windows* workstation on the network. It requires the Novell Client™ for Windows software. It also requires access to a server with a Read/Write replica of the eDirectory tree's Root partition.

- 1 On a Windows 2000 or Windows XP Professional Edition workstation that has the latest Novell Client software installed on it, log in to your existing network as a user with the Supervisor right.
If you are prompted to log in again while running the Deployment Manager, you can specify the IP address of the server by clicking *Details*.
- 2 Insert the *NetWare 6.5 SP8 CD 1 (Operating System)* or *NetWare 6.5 SP8 DVD* and go to the root of the CD/DVD.
- 3 If you want to run the browser-based version of Deployment Manager and you have an Internet Explorer* 5 or 6 browser installed, run `nwdeploy.exe` located at the root of the CD/DVD.
or

If you prefer to run a standalone version of Deployment Manager that does not require a browser, or you do not want to use the ActiveX* control included with the browser-based version, run `nwdeploynobrowser.exe` located at the root of the CD/DVD.

2.5.2 Required Deployment Manager Tasks

The tasks you need to perform in Deployment Manager depend on a number of factors, such as the version of NDS/eDirectory you have in your tree, whether you are installing or upgrading a server, the version of NetWare on your server, and whether the server is part of a cluster.

For OES NetWare and NetWare 6.5 Servers

If you already have an OES NetWare or NetWare 6.5 server in your tree, you do not need to run Deployment Manager.

Optionally, you can complete the **Schema Update** task to make the required extensions to the eDirectory schema and the extensions for products and services that are bundled with OES NetWare. This eliminates the need for future server installers to have Admin rights to the root of the tree.

For OES Linux Servers

If you are installing an OES Linux server into an existing eDirectory tree that contains no NetWare 6.5 or OES NetWare servers, you must first complete the **Prepare for New eDirectory** task if the tree is any version of NDS or eDirectory earlier than eDirectory 8.6.

Optionally, you can complete the **Schema Update** task to make the required extensions to the eDirectory schema and the extensions for products and services that are bundled with OES Linux. This eliminates the need for future server installers to have Admin rights to the root of the tree.

No other Deployment Manager tasks apply to OES Linux servers. See the *OES 2 SP1: Linux Installation Guide* for information about preparing a Linux server for OES.

2.5.3 Network Preparation

Complete the applicable tasks to properly prepare your network before installing or upgrading to NetWare 6.5 or OES NetWare, or before installing an OES Linux server into an existing NDS 6, 7, or 8 tree.

- ♦ “Prepare for New eDirectory” on page 28
- ♦ “Update Certificate Authority Objects” on page 28
- ♦ “Prepare for Universal Password” on page 29
- ♦ “Prepare for CIFS/AFP” on page 29
- ♦ “Verify NCI Keys” on page 29
- ♦ “Schema Update” on page 29

Prepare for New eDirectory

This task extends the core schema to ensure that new NetWare 6.5 or OES NetWare servers can communicate with an existing NDS/eDirectory tree. This task requires access to a server with a Read/Write replica of the Root partition.

Start Deployment Manager, choose this task, and follow the displayed instructions to extend the schema.

Update Certificate Authority Objects

Novell Certificate Server™ is an integrated Public Key Infrastructure (PKI) built in to eDirectory. The NetWare installation process uses Novell Certificate Server to create an Organizational Certificate Authority (CA) and to issue certificates for applications that consume Secure Socket Layer (SSL) services.

Novell delivered a base-level PKI with NetWare 5.0. Because your network might be configured with the NetWare 5.0 PKI, you should follow the steps outlined in this task to properly upgrade from the NetWare 5.0 PKI and to correctly configure your network for Novell Certificate Server.

Start Deployment Manager, choose this task, and follow the displayed instructions to create or update a Security container object and a Certificate Authority (CA) object.

Prepare for Universal Password

OES NetWare offers a Universal Password feature to simplify the integration and management of different password and authentication systems into a coherent network.

Universal Password specifically addresses two problems:

- ♦ Management of multiple types of password authentication methods from disparate systems
- ♦ Authentication from different systems using passwords with extended characters

This is accomplished by moving all services to utilize a common password, or Universal Password, in the system. Backwards compatibility is maintained to support legacy systems in the network.

Universal Password is *not* turned on by default. This is to avoid problems with users logging in who might have international characters in their passwords or who used case-sensitive passwords.

If you plan to enable Universal Password, **Start Deployment Manager** and choose this task. It is an informational step only, containing a link to information about *Universal Password deployment* (<http://www.novell.com/documentation/nmas23/admin/data/allq21t.html>) that provides step-by-step instructions for setting up the Universal Password feature.

Prepare for CIFS/AFP

If you have CIFS (Microsoft* Windows native networking workstations) and AFP (Apple* Filing Protocol native networking workstations) users on your network and you want them to log in to your new OES NetWare server, you must implement one of the following options:

- ♦ Novell Modular Authentication Service (NMAS) must be running on a server in the same partition that the new OES NetWare server is to reside in. Additionally, the server running NMAS must contain a read/write replica of the partition where the CIFS and AFP users exist.
- ♦ The new OES NetWare server that you want your CIFS and AFP users to log in to must contain a read/write replica of the partition.

Start Deployment Manager and choose this task. This task is an informational step only, providing instructions to prepare your new OES NetWare server so CIFS and AFP users can log in to it and containing links for more detailed information.

Verify NCI Keys

If you have updated eDirectory, Novell recommends that you check your tree for SDI key consistency. If the tree contains invalid SDI keys, then CIFS, AFP, Nsure Identity Manager, and Universal Password might not work after installing OES NetWare.

Start Deployment Manager, choose this task, and follow the displayed instructions to check your eDirectory tree for SDI key consistency. If any invalid keys exist, fix them by running SDIDIAG at the server console.

Schema Update

This optional task extends the eDirectory schema for all of the products and services that are bundled with OES on both the NetWare and Linux platforms. Doing so eliminates the need for future server installers to have administrative rights to the root of the tree.

Before performing the schema update for OES NetWare, you must have already updated NetWare 5/NDS 7 servers to be compatible with eDirectory as described in the [Prepare for New eDirectory](#) task. You also need access to a NetWare server with a Read/Write replica of the Root partition by an admin user with rights to [Root].

If you want to do this, [start Deployment Manager](#) and choose this task before upgrading or installing new servers to allow the schema updates to synchronize to all partitions in your tree.

2.5.4 Install/Migration Options

After you have completed the Network Preparation section of Deployment Manager, click the *Overview* link located under the *Install/Migration Options* heading to help you choose the installation or migration task that best meets your needs.

- ♦ [“Install NetWare 6.5” on page 30](#)
- ♦ [“Automate an Installation” on page 30](#)
- ♦ [“Consolidate or Migrate Servers” on page 30](#)

Install NetWare 6.5

If you have a new computer that you want to install OES NetWare on, or if you are adding an OES NetWare server to your existing network, [start Deployment Manager](#) and choose this task for links to instructions and prerequisites.

Automate an Installation

[Start Deployment Manager](#) and choose this task for instructions on automating the OES NetWare installation using a response file and to access the Response File Generator utility which assists you in creating response files.

For more information about response files and running the Response File Generator utility, see [Appendix A, “NetWare Response File Reference,” on page 99](#).

Consolidate or Migrate Servers

OES 2 includes a new set of migration tools for migrating from NetWare to OES Linux. The core file system migration tools are installed by default on every OES 2 Linux server. For instructions on using these tools, see the [OES 2 SP1: Migration Tool Administration Guide](#).

The Server Consolidation and Migration Toolkit is also included in OES 2 for NetWare to NetWare migrations. You can install the toolkit from this task in Deployment Manager. [Start Deployment Manager](#) and click the *Install/Run the Server Consolidation and Migration Toolkit* link. If you have already installed the toolkit, clicking this link starts the toolkit. For instruction on using the toolkit, see the [Novell Server Consolidation and Migration Toolkit Administration Guide](#).

2.5.5 Post-Install Tasks

After you run the NetWare Install program, you can return to Deployment Manager and perform any necessary post-install tasks.

- ♦ [“Create Additional Volumes” on page 31](#)
- ♦ [“Install NetWare 6.5 Products” on page 31](#)

- ♦ [“Use DSREPAIR” on page 31](#)
- ♦ [“Remove Deployment Manager” on page 31](#)

Create Additional Volumes

By default, the NetWare Install program creates a sys: volume on the server. (When NetWare 6.5 and OES NetWare are installed, a special _Admin volume is also created.)

NetWare 6.5 and OES NetWare give you the option to create additional volumes during the installation process. This allows you to install products on a new data volume rather than filling up the server’s SYS volume.

If you want to create additional data volumes after the installation is completed, [start Deployment Manager](#) and choose this task for information and links to relevant documentation.

Install NetWare 6.5 Products

Installing additional products after an OES NetWare server installation is a simple procedure. Products can be installed at the server GUI console, or remotely by clicking the link.

Use DSREPAIR

After installing or upgrading to a new version of NetWare, you should run DSRepair. The DSRepair utility is provided with NetWare to repair problems with eDirectory on a single-server basis. It does not correct problems on other servers; it must be run on each server individually.

[Start Deployment Manager](#) and choose this task for additional information on running DSRepair.

Remove Deployment Manager

The first time you run Deployment Manager, it installs files totaling approximately 80 MB onto your Windows workstation. The utility should load faster after the first time it runs because these files have already been installed.

If you want to remove the Deployment Manager files to save disk space or to run an older version of Deployment Manager from a previous NetWare 6.5 Support Pack release, [start Deployment Manager](#) and choose this task.

2.5.6 Exiting Deployment Manager

After you have completed the tasks in the Network Preparation section and decided on an installation or upgrade option, exit Deployment Manager by closing the browser window.

2.6 What’s Next

To take advantage of OES 2 on the NetWare 6.5 platform, start by updating or installing your servers. See [Chapter 3, “Upgrading to OES 2 SP1 NetWare,” on page 33](#) or [Chapter 4, “Installing OES 2 SP1 NetWare \(Physical\),” on page 37](#).

Upgrading to OES 2 SP1 NetWare

3

This section describes how to update an existing server running Novell® Open Enterprise Server 2 (OES 2) for NetWare® by applying a Support Pack.

NOTE: In-place and remote server upgrades are no longer supported in OES 2 SP1 NetWare. The update method described in this section is the only supported method for upgrading a NetWare server to NetWare 6.5 SP8.

If you have a server running a previous version of NetWare that you want to upgrade to NetWare 6.5 SP6 as part of a two-phase upgrade to NetWare 6.5 SP8, see [Appendix C, “Upgrading to NetWare 6.5 SP6,” on page 183](#).

To update an existing NetWare server to NetWare 6.5 SP8, complete these tasks:

- ♦ [Section 3.1, “Understanding NetWare Support Packs,” on page 33](#)
- ♦ [Section 3.2, “Obtaining NetWare 6.5 Support Pack 8,” on page 34](#)
- ♦ [Section 3.3, “Installing the Support Pack,” on page 34](#)
- ♦ [Section 3.4, “Uninstalling the Support Pack,” on page 36](#)

If you need to uninstall SP8, complete this task:

- ♦ [Section 3.4, “Uninstalling the Support Pack,” on page 36](#)

3.1 Understanding NetWare Support Packs

NetWare Support Packs contain updates for components contained in the NetWare 6.5 product. The purpose of a Support Pack is to provide a bundle of fixes that have all been tested together. The files have undergone component testing, core OS testing, internationalization testing, and integration testing with other Novell products.

The latest Support Pack for OES NetWare is Support Pack 8. During the installation of this Support Pack, the following events occur:

- ♦ The files contained in the support pack are copied to the server. Newer files on the server are not overwritten. The installation program checks the version of each file. If two files have the same version, the program then checks the date of each file.

NOTE: Files contained in .zip files are copied to the server but are not compared to existing files.

- ♦ The installation program reads the `sys:\system\products.dat` file on the server to determine which products are installed and then automatically updates the files needed for those products. If the `products.dat` file is missing or corrupted, the Support Pack installation stops.

- ♦ All installed NetWare 6.5 server components are upgraded except for iManager. iManager 2.02 is not upgraded to iManager 2.7, but updates for iManager 2.02 or 2.7 are installed, depending on which version is installed.
- ♦ Upon completion of the Support Pack installation, a record is added to the `products.dat` file in the Installed Products section and the following product listing appears: “SPACK 6.5 V8.0 Support Pack for NetWare 6.5.” Any other product updates made during the upgrade are also listed.

IMPORTANT: If you install products from an earlier version of the NetWare 6.5 CDs or install other Novell products after installing the latest Support Pack, you must reinstall the NetWare 6.5 Support Pack to ensure that you have all of the applicable updates.

For example, if you install a Novell product such as BorderManager™ after installing the Support Pack, some BorderManager files might be overwritten by an older version and some features, like Virtual Private Networking (VPN), might not function. Reinstalling the latest NetWare 6.5 Support Pack ensures that all files are at the correct version level.

For more information on Support Pack issues, see the “NetWare Issues” section of the *OES 2 SP1: Readme* (http://www.novell.com/documentation/oes2/oes_readme/data/readme.html).

3.2 Obtaining NetWare 6.5 Support Pack 8

To obtain Support Pack 8 for OES NetWare, download the zip file (`NW65SP8.zip`) from the *Novell Open Enterprise Server 2 SP1 e-Media Kit* (<http://download.novell.com/Download?buildid=n6SkQz52x7s~>).

3.3 Installing the Support Pack

This section describes how to install the Support Pack.

IMPORTANT: Do not try to copy individual files from the Support Pack. Always install the full Support Pack in its entirety.

3.3.1 Preinstallation Checklist

Before installing the Support Pack, you must do the following:

- ♦ Ensure you have a reliable backup.

Before installing the Support Pack or any updates to your server, you should ensure that you have a reliable backup of the server. The backup option provided by the Support Pack installation program (see [Section 3.4, “Uninstalling the Support Pack,” on page 36](#)) will not work if the server cannot be rebooted or the volumes will not mount.

- ♦ Check your access to the server console.

Ensure that you have access to the server console and the administrative rights necessary to perform an upgrade. The Support Pack upgrade is performed by running the NWCONFIG utility either directly at the server console or remotely through NetWare Remote Manager or RCONSOLE.

- ♦ Ensure that you have rights to the [root] replica of the eDirectory tree.

Some of the products installed by the Support Pack might need to extend the schema.

- ♦ Ensure that the eDirectory tree is healthy and fully synchronized.

Check to see that eDirectory is healthy. All eDirectory operations should be completed and the replicas and time should be synchronized. If necessary, run DSREPAIR to fix any problems.

- ♦ Check disk space.

Make sure the server has enough disk space on the SYS volume. Depending on the products installed, the Support Pack might require up to 200 MB of additional disk space. If you select the backup option, which allows you to specify the target directory for the backed-up files, you need 300 MB of additional disk space.

- ♦ Unload third-party applications.

If you are running third-party applications on the server, verify that the applications are unloaded before installing the Support Pack.

3.3.2 Installing the Support Pack with NWCONFIG

The Support Pack must be installed using the NWCONFIG console utility. You can run NWCONFIG from the server console, from the Console Screens option in NetWare Remote Manager, or in RCONSOLE.

- 1 Extract the Support Pack files contained in the zip file you downloaded.

NOTE: The compressed zip file contains directory paths that could exceed the DOS limits. The file must be extracted in a root-level directory on a local drive, CD, or NetWare volume that accepts longer paths.

- 2 At the server console prompt, type NWCONFIG.

- 3 Select *Product Options > Install a Product Not Listed*.

- 4 Depending on where the NetWare Support Pack files are located, complete one of the following:

- ♦ If the files are located on a local drive or CD, press F3 and specify the full path; for example, `c:\netware\nw65SP8`.
- ♦ If the files are located on the server's SYS volume, press F3 and specify the path, including the volume name; for example, `sys:\support\nw65SP8`.
- ♦ If the files are located on a different server on the network, press F3 and specify the full path, including the server name; for example, `server1\vol1:\support\nw65SP8`. When prompted, enter the login name and password for the other server.

NOTE: The F4 option in RCONSOLE does not apply to this Support Pack.

- 5 Press Enter and follow the on-screen prompts to complete the upgrade.

After the Support Pack install is initiated through NWCONFIG, one of the screens you see is as following:



6 Select either of the following based on your requirement.

- ♦ **Yes:** The current `SYS : \TOMCAT\5.0\WEBAPPS\NPS` directory is backed up and a new one is created for iManager 2.7.2. All plug-ins that are available with the NetWare 6.5 Support Pack 8 CD are installed. You have to back up the plug-ins of previous versions of iManager if you want to revert to these versions from iManager 2.7.2. If you have any custom plug-ins installed in previous versions of iManager, you should manually reinstall them into iManager 2.7.2.
- ♦ **No:** The current `SYS : TOMCAT\5\WEBAPPS\NPS` directory is backed up and a new one is created for iManager 2.7.2. Only the core plug-ins (Directory Administration, Groups, Help Desk, Partition and Replicas, Rights, Schema, and Users) for iManager 2.7.2 are installed. However, all the plug-ins that are available on the NetWare 6.5 Support Pack 8 CD are copied to the `SYS : \TOMCAT\5.0\WEBAPPS\NPS\PACKAGES` directory for easier installation later. All other plug-ins outside NetWare 6.5 Support Pack 8 should be reinstalled manually.

7 After the Support Pack installation is complete, review the server's `.ncf` files for accuracy.

8 (Conditional) If you did not choose the option to automatically reboot the server, enter `RESET SERVER` or `RESTART SERVER` at the server console.

You can also enter `DOWN` and then restart the server by typing `SERVER.EXE` at the DOS prompt.

TIP: If Auto Purge is not set on your server, you might want to manually purge the volume to free up disk space.

3.4 Uninstalling the Support Pack

If you selected the Backup option during the Support Pack installation, files that are overwritten by the Support Pack files are backed up to `sys : \system\backSP8` (or to the location you specified) so that you can restore the server to its original state if necessary. If you didn't select the Backup option, you can't uninstall the Support Pack.

Do not uninstall the Support Pack if you installed any products or patches after the installation of the Support Pack.

- 1** At the server console prompt, type `NWCONFIG`.
- 2** Select *Product Options > View/Configure/Remove Installed Products > SPACK*.
- 3** Press Delete, then answer Yes to the confirmation prompt.

Installing OES 2 SP1 NetWare (Physical)

4

This section describes how to install physical Novell® Open Enterprise Server 2 (OES 2) for NetWare® on standard server hardware. If you want to install virtualized OES 2 SP1 NetWare, see [Chapter 5, “Installing and Managing OES 2 SP1 NetWare on a Xen-based VM Host Server,” on page 81.](#)

Installing a new server includes the following tasks:

- ♦ [Section 4.1, “Reviewing NetWare Installation Issues,” on page 38](#)
- ♦ [Section 4.2, “Starting the Installation Program,” on page 38](#)
- ♦ [Section 4.3, “Preparing the Computer,” on page 39](#)
- ♦ [Section 4.4, “Selecting the Initial Installation Settings,” on page 41](#)
- ♦ [Section 4.5, “Switching to Graphical Display Mode,” on page 45](#)
- ♦ [Section 4.6, “Choosing a Server Pattern,” on page 46](#)
- ♦ [Section 4.7, “Verifying Products to Install,” on page 61](#)
- ♦ [Section 4.8, “Verifying Pattern Selection,” on page 61](#)
- ♦ [Section 4.9, “Naming and Configuring the Server,” on page 61](#)
- ♦ [Section 4.10, “Installing Networking Protocols,” on page 63](#)
- ♦ [Section 4.11, “Specifying a Hostname for Each IP Address,” on page 67](#)
- ♦ [Section 4.12, “Setting Up Domain Name Service,” on page 67](#)
- ♦ [Section 4.13, “Setting the Server Time Zone and Time Synchronization Method,” on page 68](#)
- ♦ [Section 4.14, “Setting Up Novell eDirectory,” on page 69](#)
- ♦ [Section 4.15, “Licensing the NetWare Server,” on page 71](#)
- ♦ [Section 4.16, “LDAP Configuration,” on page 72](#)
- ♦ [Section 4.17, “Selecting the Login Method,” on page 72](#)
- ♦ [Section 4.18, “DNS/DHCP Installation,” on page 73](#)
- ♦ [Section 4.19, “iFolder Server Options,” on page 73](#)
- ♦ [Section 4.20, “MySQL Options,” on page 74](#)
- ♦ [Section 4.21, “exteNd Application Server Details,” on page 74](#)
- ♦ [Section 4.22, “exteNd Application Server Database Options,” on page 75](#)
- ♦ [Section 4.23, “NetStorage Install,” on page 75](#)
- ♦ [Section 4.24, “Completing the Server Installation,” on page 76](#)
- ♦ [Section 4.25, “Completing Post-Installation Tasks,” on page 76](#)

4.1 Reviewing NetWare Installation Issues

Before installing an OES NetWare server into an existing tree, make sure you have prepared the network as instructed in [Section 2.4, “Preparing the Network,” on page 23](#).

For a list of known install-related issues in this release of OES NetWare, see “Installation Issues” in the “NetWare Issues” section of the *OES 2: Readme* (http://www.novell.com/documentation/oes2/oes_readme/data/oes_readme.html).

If a problem occurs (critical errors, the installation fails, etc.) during the installation procedure *before* the file copy and the Operating System installation is complete, you must start the installation again from the beginning.

If a problem occurs (critical errors, the install fails, etc.) during the product installation procedure *after* the file copy and the OS install is complete, the installation finishes. An error is generated telling you which individual product installation failed, but the remaining products install normally.

TIP: If you attempt to install a new server into your tree at the same time you upgrade another server in the tree to OES NetWare, you might have difficulty logging in to the server being upgraded until the other server’s installation is complete.

4.2 Starting the Installation Program

The method of starting the OES NetWare installation program differs depending on whether you are installing from CD/DVD media, from DOS, or from a network drive.

- ♦ If you are using a network drive to install OES NetWare, follow the instruction given in the [Section 4.3, “Preparing the Computer,” on page 39](#).
- ♦ To use the bootable NetWare option, insert the *NetWare 6.5 SP8 CD 1 (Operating System)* or *NetWare 6.5 SP8 DVD* and boot the computer. Unless you press a key to interrupt the installation preparation, the OES NetWare Install program launches automatically.

If you want to specify additional installation parameters, press any key before the installation program begins, press **P**, and then enter the parameters using this syntax:

```
[INST: parameter1 parameter2 parameter3 ...]
```

You must include the square brackets as part of the parameter string.

For example, to skip the hardware check that is usually performed when installing or upgrading a server, enter:

```
[INST: -nocheck]
```

IMPORTANT: If you use this parameter to attempt to install OES NetWare on a system that doesn’t meet the minimum requirements, the installation might fail or the server might perform poorly.

For more information, press **H** to view the online help.

- ♦ To start the OES NetWare Install program on the CD from DOS, change to the `root` directory and enter:

```
install [/parameter1 /parameter2 . . .]
```

- ♦ To run the OES NetWare Install program from a network drive, log in to the network, change to the `root/install` directory, and enter:

```
install [/parameter1 /parameter2 . . .]
```

For a list of installation parameters, see [Appendix B, “Install Command Line Options,” on page 181](#).

Navigating in the Character-Based Screens

The initial screens of the installation program display in text-based mode. Auto-detected and default settings appear on each screen.

You can accept the detected and default settings, or you can modify the settings to meet the needs of your networking environment.

NOTE: To continue the installation with the standard settings, use the arrow keys to select *Continue* in the Options box, then press Enter.

To modify the settings, use the arrow keys to select *Modify* in the Options box, then press Enter. Select the field to be modified, then press Enter. Select or enter the appropriate value.

Some screens require additional keystrokes in order to navigate through the interface. Information about screen navigation appears at the bottom of each screen.

4.3 Preparing the Computer

Complete the following tasks to prepare your computer for the OES NetWare installation:

- [Section 4.3.1, “Installing Computer and Networking Hardware,” on page 39](#)
- [Section 4.3.2, “Creating and Formatting a Boot Partition,” on page 39](#)
- [Section 4.3.3, “Accessing the Installation Files,” on page 40](#)

4.3.1 Installing Computer and Networking Hardware

Follow the manufacturer’s instructions to install and connect the network board and network cabling to your computer. Make sure that all storage devices are properly attached to the storage adapters.

4.3.2 Creating and Formatting a Boot Partition

Novell recommends that you install NetWare onto a clean, error-free disk drive. OES NetWare requires a DOS partition in standard FAT format to hold the NetWare operating system startup and server files. If an adequate boot partition already exists on your machine, proceed to [“Accessing the Installation Files” on page 40](#).

TIP: You should increase the size of your boot partition to accommodate your specific configuration requirements. See [“Meeting System Requirements” on page 19](#).

To create and format a DOS boot partition:

- 1 Back up any desired data to another computer or offline storage media.
- 2 Boot your computer with DOS 3.3 or later.

- 3 If the computer already has an operating system installed, such as Windows or a previous installation of NetWare, you should completely remove the existing partitions and the operating system.

You can use FDISK to remove partitions, or the partitions can be deleted from the Prepare Boot Partition screen during the OES NetWare installation.

- 4 If you want to use FDISK to create an active DOS partition, enter FDISK at the DOS prompt.
Create a primary DOS partition and make it the active partition. See “**Meeting System Requirements**” on page 19 for minimum requirements. The computer will restart.
- 5 Format and transfer DOS system files to the partition by changing to drive a: and entering
FORMAT C: /S at the DOS prompt.
- 6 Run SCANDISK or CHKDSK /F (depending on the machine's version of DOS) to verify the integrity of the DOS partition.
- 7 In the machine's config.sys file, set FILES=50.

Your computer should now have an active DOS partition that meets or exceeds the minimum requirements. Continue the installation by accessing the installation files.

4.3.3 Accessing the Installation Files

OES NetWare can be installed from the server's local CD or DVD drive or from installation files located on the network. If you want to run the OES NetWare Install program from a network drive, complete the steps in “**Preparing to Run the OES NetWare Installation from a Network Drive**” on page 40.

Starting in NetWare 6.5 SP1, Novell added an option during a new server install to use NetWare as the Boot OS instead of Caldera* DOS (overlay install only). This option allows you to proceed with the OES NetWare Install program directly without having to boot DOS first. To use this option, make sure your computer is set up to boot from the CD drive before the hard drive. Skip to **Section 4.2, “Starting the Installation Program,”** on page 38.

Preparing to Run the OES NetWare Installation from a Network Drive

- 1 Make sure that the DOS config.sys file contains the FILES=50 and BUFFERS=30 commands.
- 2 Make sure the config.sys and autoexec.bat files are configured to load the CD-ROM drivers for your computer. The logical filename of your CD drive (specified in these files) must *not* be CDDVD.
- 3 Boot your computer with DOS 3.3 or later.
- 4 Install the IP Server Connection Utility (srvinst2.exe) software.
- 5 Copy the contents of both *NetWare 6.5 SP8 CD 1 (Operating System)* and *NetWare 6.5 SP8 CD 2 (Products)* to the same directory on your network. In copying these two CDs to the network, you might see messages regarding duplicate files. This is because some of the files for OES NetWare are placed on both CDs. Proceed past the duplicate file messages and continue the copy to the network.

Alternatively, you can copy the contents of *NetWare 6.5 SP8 DVD* to the network.

Using Updated Files During the Installation

The `c:\nwupdate` directory structure for OES NetWare mirrors the directory structure of the install image. Updated files should be placed in the `c:\nwupdate` subdirectory that corresponds to where they are located in the install image.

There are two notable exceptions to this rule:

- ♦ Install scripts (`sys_inst.ils`, `dos_inst.ils`, `defpre.ils`, `defcopy.ils`, etc.) should be placed in the `c:\nwupdate` directory.

NOTE: `Defpre.ils` and `defcopy.ils` are dummy scripts called from `dos_inst.ils` (the first C-Worthy copy) and `sys_inst.ils` (the second C-Worthy copy), respectively, and are intended to be modified for OEM use. These scripts are also used in NetWare 6.0.

- ♦ The subdirectories of the `c:\nwupdate\drivers` directory (`\storage`, `\lan`, `\psm`, `\sbd`, `\cios`) have been eliminated. Their files and subdirectories should be placed in the `c:\nwupdate\drivers` directory.

There is a blackout period during the install when access to the DOS drives (C:, D:, etc.) is prohibited. This occurs during the time that platform support and storage drivers (PSMs, HAMs, SBDs, and CDMs) are detected and loaded. However, they can be loaded from a floppy disk.

4.4 Selecting the Initial Installation Settings

The initial server installation settings include choosing the language and regional settings, accepting the license agreements, and deciding whether to do a default or manual installation.

- 1 Select the language for the install, then press Enter.

This setting specifies the language for the install program only. You can select other language options, such as the language for the user or the operating system, later during the installation.

- 2 The next screen allows you to modify the regional settings. The default settings are:

- ♦ Country Code: 001 (USA)
- ♦ Codepage: 437 (United States English)
- ♦ Keyboard: United States

To accept the defaults, select *Continue* and press Enter.

or

To change the settings, select *Modify* and press Enter.

- 3 Press F10 to accept the Novell Software License Agreement.
- 4 Press F10 to accept the JReport Runtime License Agreement.

Accepting each License Agreement means that you have read and agreed to the terms and conditions contained in the License Agreement.

4.4.1 Selecting Default or Manual Installation

The next screen allows you to select either a Default Installation or a Manual Installation.

The Default Installation automatically detects drivers and installs the OES NetWare server with the following default settings:

- ♦ 100 MB DOS partition (unless you have already created a larger one)
- ♦ 4 GB (4000 MB) volume sys:—any remaining disk space is left as free space

IMPORTANT: In NetWare 6.5 SP8, the default size of 4 GB for the sys: volume is not large enough to accommodate server installations that include iManager, Apache, and Tomcat. To avoid running out of disk space on the sys: volume, you should select a manual installation and set the size of the sys: volume to at least 8 GB.

- ♦ LAN and disk drivers auto-discovered and loaded
- ♦ Video mode: Super VGA Plug N Play
- ♦ Mouse: Auto-discovered and loaded

The Manual Installation allows you to modify detected drivers and choose specific configuration options for your networking environment. It also allows for the manual configuration of the default settings used in the Default Installation. You must choose Manual Installation to create volumes other than the sys: volume during the install.

NOTE: If you select a Default installation, you still have the chance later in the installation to select the individual products that you want to install. You can also create additional volumes after the server is installed.

- ♦ [“Default Installation” on page 42](#)
- ♦ [“Manual Installation” on page 43](#)

Default Installation

To choose the Default installation option:

- 1 If necessary, press Enter to toggle the install option to *Default*.
- 2 (Optional) If you have previously prepared a response file to automate the server installation, press *F3* and specify the full path name of the response file.
- 3 Select *Continue* and press Enter.
A screen is displayed, showing the default settings for the size of the sys: volume, LAN and disk driver discovery, and video mode.
- 4 If you need to change the default settings, select *Back* and press Enter. This takes you to the previous screen so you can select the Manual installation option.
or
Select *Continue* and press Enter.

If you have an existing boot partition on the server, but the installation program determines that it is not big enough for the install to continue, you see an error message to that effect. Press Enter to see the Prepare Boot Partition screen, showing the current settings for the DOS partition, NetWare partition (if any), and free space.

To modify the partition settings:

- 1 In the Prepare Boot Partition screen, select *Modify* and press Enter.

2 Make the desired changes.

You must delete the existing DOS partition in order to create a new one. Follow the on-screen prompts to complete the operation.

3 Select *Continue* and press Enter.

A screen is displayed showing the settings for the size of the sys: volume, LAN and disk driver discovery, and video mode.

4 Select *Continue* and press Enter.

To continue the Default installation, skip to [Section 4.5, “Switching to Graphical Display Mode,” on page 45](#).

Manual Installation

To choose the Manual installation option:

- 1** Press Enter to toggle the Default or Manual installation option to *Manual*.
- 2** (Optional) If you have previously prepared a response file to automate the server installation, press F3 to specify the full path name of the response file.
- 3** Select *Continue* and press Enter.

Prepare Boot Partition

The Prepare Boot Partition screen displays the default settings for the DOS partition, NetWare partition (if any), and free space.

To accept the default settings:

- 1** Select *Continue* and press Enter.

To modify the default settings:

- 1** In the Prepare Boot Partition screen, select *Modify* and press Enter.
- 2** Make the desired changes.
- 3** Select *Continue* and press Enter.

Server Settings

The following defaults are set:

- ♦ A server ID number is provided
- ♦ The option to load the server at reboot is set to Yes
If you don't want to automatically restart the NetWare server after a reboot, change the setting to *No*.
- ♦ The option to modify the boot sector is set to DOS
If NetWare is selected and DOS is the OS that normally boots when the system comes up, the installation modifies the boot sector to load NetWare instead of DOS. If DOS is selected and NetWare is the normal boot OS, the installation will restore the DOS boot sector.
- ♦ The option to allow unsupported drivers is set to *No*

If *Yes* is selected, then drivers that have not been tested and approved for NetWare are automatically selected and loaded if no other drivers are available.

- ♦ The video option is set to *SVGA Plug N Play*

To modify any of these default settings, or to edit the server SET parameters:

- 1 Select *Modify* and press Enter.

If you choose to edit the server SET parameters, a screen displays where you can specify new SET parameters or other commands (Load, etc.). SET parameters specified here are saved and run from the server's registry. All other commands specified here are saved and run from the `startup.ncf` file.

- 2 Make any desired changes.
- 3 Select *Continue* and press Enter.

Device Driver Settings

A file copy procedure begins to copy the necessary NetWare server files to the boot partition. After the file copy, the device drivers are detected and you are presented with a screen or screens where you can modify these settings.

If you do not want to modify the settings:

- 1 Select *Continue* and press Enter.

If you want to modify the settings:

- 1 Select *Modify* and press Enter.
- 2 Make any desired changes.
- 3 Select *Continue* and press Enter.

Existing NetWare Partition or Volume

The Novell Storage Services Management Utility (NSSMU) now displays. NSSMU is a console-based utility for managing storage devices on a server. NSSMU is the interface you use to set up at least your basic storage solution during the installation of OES NetWare.

If an existing NetWare partition or volume is discovered on the server, NSSMU indicates this. You are given two options: (1) Remove only the NetWare sys: volume and pool/partitions, or (2) Remove all NetWare volumes and partitions.

- 1 Select the desired option.
- 2 Press Enter.

You will next see a Create SYS Volume screen.

- 1 Select the *sys: volume size* option.
- 2 Specify the desired size of the sys: volume in MB.

IMPORTANT: In NetWare 6.5 SP8, the default size of 4 GB for the sys: volume is not large enough to accommodate server installations that include iManager, Apache, and Tomcat. To avoid running out of disk space on the sys: volume, you should set the size of the sys: volume to at least 8 GB.

- 3 Press *u* to select the *Create* option.
- 4 Press Enter again.

You now see the NSSMU Main Menu screen. From this screen, you can create or modify devices, partitions, pools, raid devices, and volumes.

- 1 Select the desired option and press Enter.
- 2 Follow the on-screen prompts, and when you are finished, return to the Main Menu.
For more information, see “NSSMU for NetWare” in the *OES 2 SP1: Utilities Reference for NetWare*.
- 3 Select *Continue Installation* and press Enter.
- 4 Continue with [Section 4.5, “Switching to Graphical Display Mode,”](#) on page 45.

4.5 Switching to Graphical Display Mode

The OES NetWare system files are copied to volume sys:. This file copy process takes several minutes.

If you are installing from the network, you are prompted to reconnect to the network. To continue the installation, type the password for the user that originally logged in. The file copy process continues for another few minutes. The OES NetWare installation program then switches to graphical display mode.

Navigating in Graphical Mode

Although a mouse is recommended, you can use the keyboard commands in [Table 4-1](#) to navigate through the graphical portion of the installation program. Use the arrow keys on the numeric keypad for cursor movements.

NumLock (number lock) must be on in order for cursor movements to be enabled on the keypad.

Table 4-1 Keyboard Commands to Navigate through the NetWare Installation Program

Keystroke	Action
Tab	Move to the next element
Shift+Tab	Move to the previous element
Enter	Select
Ctrl+Tab	Move to the next text area
Up-arrow (keypad 8)	Move cursor up
Down-arrow (keypad 2)	Move cursor down
Right-arrow (keypad 6)	Move cursor right
Left-arrow (keypad 4)	Move cursor left
Hold Shift while pressing the key	Accelerate cursor movement
Keypad 5	Select or click an object

Keystroke	Action
Keypad 0	Lock a selected object (for dragging)
Keypad . (period)	Unlock a selected object (to drop)
Keypad + (plus)	Double-click an object
Alt+F7	Move to the next window
Alt+F8	Move to the previous window

The following sections explain how to complete the NetWare installation.

4.6 Choosing a Server Pattern

After the file copy is complete, the Choose a Pattern page displays and you are given the opportunity to select the type of server you want to install. Clicking the name of a special-purpose server (pattern) displays a description of that server in the Description window.

The following types of pattern installations are available in OES NetWare (exact patterns might vary depending on the Support Pack level):

- ♦ “Customized NetWare Server” on page 46
- ♦ “Basic Netware File Server” on page 49
- ♦ “Pre-Migration Server” on page 49
- ♦ Preconfigured Servers
 - ♦ “DNS/DHCP Server” on page 51
 - ♦ “exteNd J2EE Web Application Server” on page 51
 - ♦ “LDAP Server” on page 52
 - ♦ “NetWare AMP (Apache, MySQL, PHP, and PERL) Server” on page 53
 - ♦ “NetWare Backup Server” on page 54
 - ♦ “QuickFinder Server” on page 54
 - ♦ “Network Attached Storage (NAS) Server” on page 55
 - ♦ “Novell iPrint Server” on page 56
 - ♦ “Apache/Tomcat Server” on page 56
 - ♦ “iSCSI SAN Storage Server” on page 57
 - ♦ “Novell iFolder Storage Services” on page 58
 - ♦ “Management Server” on page 59
 - ♦ “Virtual Office Server” on page 60

4.6.1 Customized NetWare Server

This option gives you the freedom to install any combination of products you want.

After you select *Customized NetWare Server* and click *Next*, the Components page displays and you can choose which additional OES NetWare components to install.

To view a description of a component, place the cursor over the component name.

To select additional components to install, click the check box next to each component you want to install and then click *Next*.

The displayed default selections can be deselected if desired.

NOTE: The iManager installation might take up to 15 minutes to complete. During this installation, the page does not change.

The Customized NetWare Server pattern gives you the flexibility to install any of the NetWare files needed for setting up a server. Following are some of the components that you might want to select and the reasons for choosing them.

- ♦ iPrint is required for setting up printing on the server. If you select this option, select iManager also.
- ♦ Novell DNS/DHCP Services is required for setting up DNS or DHCP services on the server. If you select this option, select iManager also.
- ♦ Novell iFolder[®] Storage Services lets you set up a software solution so your users' files can follow them across multiple workstations and the Internet. Selecting this component also requires you to select these components:
 - ♦ Apache 2 Web Server and Tomcat 4 Servlet Container
 - ♦ iManager
 - ♦ WAN Connectivity
- ♦ Novell iManager is the cross-platform management console for performing network setup, maintenance, and monitoring tasks. Selecting this component also requires you to select these components:
 - ♦ Apache 2 Web Server and Tomcat 4 Servlet Container
 - ♦ iPrint
 - ♦ Novell DNS/DHCP Services
 - ♦ Novell eGuide (eDirectory[™] Address Book Web Application)
 - ♦ WAN Connectivity
- ♦ Novell Virtual Office (not available in NetWare 6.5 SP5) lets you set up a software solution where users can set up and manage many of their own networking, information sharing, and data backup processes. It also lets users create project teams, organize projects, and collaborate with team members in real time from any location. Virtual Office optimizes the concept of self service for users, which significantly reduces support calls. Selecting this component also requires you to select these components:
 - ♦ Apache 2 Web Server and Tomcat 4 Servlet Container
 - ♦ iPrint
 - ♦ Novell eGuide (eDirectory Address Book Web Application)
 - ♦ Novell iFolder Storage Services
 - ♦ Novell iManager
 - ♦ Novell NetStorage

- ♦ QuickFinder™ Server
- ♦ WAN Connectivity
- ♦ WAN Connectivity is required for setting up Internet connectivity on the server. If you select this option, select iManager also.

1 Select the components you want and click *Next*.

2 Continue with [Section 4.7, “Verifying Products to Install,” on page 61](#).

The product components listed in [Table 4-2](#) are installed by default and are needed for basic server operation. They are copied to the server by selecting a Customized server type or any of the pattern installation options.

Table 4-2 *Default Components Installed with Customized and Preconfigured Server Patterns*

Component	Description
Apache 2 Admin Server 2.0.59	administrative instance of Apache 2
Beans for Novell Services 1.1.0	Java* components for rapid development of network applications
ConsoleOne® 1.3.6e and Reporting Snapin	Java-based administration tool for managing Novell and third-party products on a variety of platforms
eDirectory 8.8.2	Novell's cross-platform directory service for controlling users and network resources
eDirectory Management Utilities Toolbox 8.7.3	Java-based tools for remotely accessing eDirectory back-end utilities, such as DSRepair, DSMerge, Backup and Restore, and Service Manager, as well as accessing them on the server; often referred to as “eMBox”
LDAP Services 8.7.3	Novell's implementation of the Lightweight Directory Access Protocol, which provides access to a compliant directory via TCP/IP
NDS® iMonitor Services 2.3.0	Browser-based utility for cross-platform eDirectory monitoring and diagnosis
NetWare Remote Manager (NRM) 4.0.3	Browser-based management utility for server health monitoring
Novell Certificate Server™ 3.3.0	eDirectory component that allows the administrator to mint, issue, and manage digital certificates
Novell International Cryptographic Infrastructure (NICI) 2.7.3	Encryption modules that form the basis of security services offered in NetWare
Novell Licensing Services 5.0.2	Network service that enables administrators to monitor and control the use of licensed applications on the network
Novell Modular Authentication Services (NMAS™) 3.2.0	Login framework that provides developers the ability to integrate multiple authentication services using eDirectory systems

Component	Description
Novell Script for NetWare 2.0	NetWare-based scripting language with PHP and Perl support
Novell TLS Library 2.0.2	Cryptographic protocol which provides secure communications on the Internet; successor to Secure Sockets Layer (SSL)
OpenWBEM 3.1	Set of management and Internet standard technologies developed to unify the management of enterprise computing environments
Perl 5.8.4	Novell's implementation of Perl, which is a general-purpose scripting language for creating scripts on the Web
PHP 5.0.5	Novell's implementation of PHP, which is a cross-platform, HTML-embedded, general purpose, server-side scripting language that is used to create dynamic Web pages
Pervasive SQL 2000i 7.9.4	Relational database management system for NetWare internal use
Secure Authentication Services 1.7.5	Network service that facilitates authentication for applications, and that manages cryptography used by authentication and communication services such as Secure Socket Layer (SSL)
Storage Management Services™ (SMS) 1.1.6	Device-independent services that enable a user to back up or restore the eDirectory database, the file system, or an individual workstation's hard disk
Tomcat 4 Admin Instance 4.1.34	Administrative instance of Tomcat 4

4.6.2 Basic Netware File Server

This option installs only the basic NetWare operating system. This option is appropriate if you want to get the server up and running quickly and install products later. The Basic NetWare File Server option copies only the components needed for a basic NetWare server, which are those shown in [Table 4-2 on page 48](#).

After selecting this option, click *Next* and then proceed to [Section 4.8, “Verifying Pattern Selection,” on page 61](#).

4.6.3 Pre-Migration Server

This option installs a NetWare server that an existing server will be migrated to at a later time by using the NetWare Migration Wizard utility. The Migration Wizard connects the servers involved in a migration using one of two methods: SLP or the `sys:\etc\hosts` file.

Minimum System Requirements

- ☐ Single processor

- ❑ Server-class PC with a Pentium III 550 MHz or AMD K7 processor
- ❑ 512 MB RAM

Recommended System Requirements

- ❑ Dual processor
- ❑ Server-class PC with a Pentium III 550 MHz or AMD K7 processor
- ❑ 1 GB RAM

The Pre-Migration Server option copies only the files needed for a Pre-Migration server, including those for the following products:

- ♦ eDirectory
- ♦ NDS iMonitor Services
- ♦ NetWare Remote Manager
- ♦ Novell Certificate Server
- ♦ Novell International Cryptographic Infrastructure (NICI)
- ♦ Novell Licensing Services
- ♦ Novell Modular Authentication Services (NMAS)
- ♦ Novell Script for NetWare (for PHP and Perl support)
- ♦ Novell TLS Library
- ♦ Perl
- ♦ Pervasive SQL* 2000i
- ♦ PHP
- ♦ Secure Authentication Services
- ♦ Storage Management Services (SMS)

In order to successfully complete a migration, either the `sys:\etc\hosts` file on the Pre-Migration Server must contain the IP address and server name of the source server involved in the migration, or SLP must be configured on the Pre-Migration Server.

For instructions on how to configure SLP on this server, see [“Installing IP and IPX” on page 65](#).

After completing the Pre-Migration Server installation, to modify the `sys:\etc\hosts` file on the Pre-Migration Server:

- 1 On the Pre-Migration Server’s server console, enter `edit`.
- 2 Press the Insert key.
- 3 Select `sys:` and press Enter.
- 4 Select `etc` and press Enter.
- 5 Select `hosts`, then press Enter twice.
- 6 Add the IP address and server name of the source server involved in the migration project.
Type the IP address and server name as `xxx.xxx.xxx.xxx Server_Name`.
- 7 Save the file.
- 8 Run the migration project.

After selecting this option, click *Next* and then proceed to [Section 4.8, “Verifying Pattern Selection,” on page 61](#).

4.6.4 DNS/DHCP Server

This option integrates the Domain Name System (DNS) and Dynamic Host Configuration Protocol (DHCP) into the eDirectory database. Integrating these services into eDirectory provides centralized administration and enterprise-wide management of network (IP) addresses, configuration, and hostnames.

Minimum System Requirements

- ☐ Single processor
- ☐ Server-class PC with a Pentium III 550 MHz or AMD K7 processor
- ☐ 512 MB RAM

Recommended System Requirements

- ☐ Dual processor
- ☐ Server-class PC with a Pentium III 550 MHz or AMD K7 processor
- ☐ 1 GB RAM

The DNS/DHCP Server option extends the schema for DNS/DHCP and creates a dedicated DNS/DHCP server by copying only the files needed, including those for the following products:

- ♦ Apache 2 Web Server and Tomcat 4 Servlet Container
- ♦ Novell DNS/DHCP Services
- ♦ Novell iManager
- ♦ Files installed by default. See [Table 4-2 on page 48](#).

For information about configuring DNS/DHCP after the installation, see the [OES2 SP1: Novell DNS/DHCP Services for NetWare Administration Guide](#).

After selecting this option, click *Next* and then proceed to [Section 4.8, “Verifying Pattern Selection,” on page 61](#).

4.6.5 exteNd J2EE Web Application Server

This option installs a highly optimized configuration of the Novell exteNd™ Application Server (Enterprise Edition). It is a comprehensive J2EE* server for deploying enterprise-class Web applications. It supports the full Java 2 Enterprise Edition standard: JavaServer* Pages (JSP pages), Enterprise JavaBeans* (EJBs), and all other J2EE 1.3 components and technologies. The Novell exteNd Application Server provides high performance, scalability, and reliability; support for rapid application development; application deployment facilities; and server management facilities.

Also included:

- ♦ A complete set of Web Services for building SOAP (Simple Object Access Protocol)-based applications that can use either the light or enterprise edition of the Novell UDDI server.
- ♦ Several working samples that can be modified for your own use. These include the J2EE Pet Store and SilverBooks, both examples of a simple ecommerce application.

IMPORTANT: You must also install Novell exteNd Workbench™ from the client CD. It is the integrated development environment (IDE) designed specifically to help you build Web Services and J2EE applications and then deploy them to your J2EE server. For information on installing Novell exteNd Workbench, see the *Novell exteNd Workbench Release Notes* (<http://www.novell.com/documentation/lg/workbench41/docs/relnotes.html>).

Minimum System Requirements

- ☐ Single processor
- ☐ Server-class PC with a Pentium III 550 MHz or AMD K7 processor
- ☐ 512 MB RAM

Recommended System Requirements

- ☐ Dual processor
- ☐ Server-class PC with a Pentium III 550 MHz or AMD K7 processor
- ☐ 1 GB RAM

The exteNd J2EE Web Application Server option creates a J2EE and Web Services server by copying only the files needed, including those for the following products:

- ♦ Apache 2 Web Server and Tomcat 4 Servlet Container
- ♦ exteNd J2EE Web Application Server
- ♦ MySQL
- ♦ Novell eGuide
- ♦ Novell iManager
- ♦ WAN Connectivity
- ♦ WAN Traffic Manager Services
- ♦ Files installed by default. See **Table 4-2 on page 48**.

For information about configuring an exteNd J2EE Web Application Server after the installation, see the Novell exteNd Application Server help.

After selecting this option, click *Next* and then proceed to **Section 4.8, “Verifying Pattern Selection,” on page 61**.

4.6.6 LDAP Server

This option installs Lightweight Directory Access Protocol (LDAP) Services for Novell eDirectory. This is a server application that lets LDAP clients (for example, Netscape* Communicator, Internet Explorer, or the Novell Import Conversion Export utility) access information stored in eDirectory.

LDAP Services includes access to the following eDirectory features through LDAP: provisioning, account management, authentication, authorization, identity management, notification, reporting, qualification, and segmentation.

Minimum System Requirements

- ☐ Single processor
- ☐ Server-class PC with a Pentium III 550 MHz or AMD K7 processor
- ☐ 512 MB RAM

Recommended System Requirements

- ☐ Dual processor
- ☐ Server-class PC with a Pentium III 550 MHz or AMD K7 processor
- ☐ 1 GB RAM

The LDAP Server option creates an LDAP server by copying only the files needed, including those for the following products:

- ♦ Files installed by default. See [Table 4-2 on page 48](#).

For information about configuring LDAP after the installation, see the “Configuring LDAP Services for Novell eDirectory” chapter of the *Novell eDirectory 8.7.3 Administration Guide*.

After selecting this option, click *Next* and then proceed to [Section 4.8, “Verifying Pattern Selection,” on page 61](#).

4.6.7 NetWare AMP (Apache, MySQL, PHP, and PERL) Server

This option lets you host Web database applications on your OES NetWare server. Available from the open-source community, Web database applications can be downloaded from the World Wide Web and easily deployed to your NetWare AMP server. Additionally, if you are familiar with the structured query language (SQL) and PHP or PERL scripting languages, you can develop and host your own Web database applications.

Minimum System Requirements

- ☐ Single processor
- ☐ Server-class PC with a Pentium III 550 MHz or AMD K7 processor
- ☐ 512 MB RAM

Recommended System Requirements

- ☐ Dual processor
- ☐ Server-class PC with a Pentium III 550 MHz or AMD K7 processor
- ☐ 1 GB RAM

The NetWare AMP (Apache, MySQL, PHP, and PERL) Server option creates a NetWare AMP server by copying only the files needed, including those for the following products:

- ♦ Apache 2 Web Server and Tomcat 4 Servlet Container

- ♦ MySQL
- ♦ NetWare FTP Server
- ♦ Files installed by default. See [Table 4-2 on page 48](#).

After selecting this option, click *Next* and then proceed to [Section 4.8, “Verifying Pattern Selection,” on page 61](#).

4.6.8 NetWare Backup Server

This option provides the infrastructure for backup and restore services on the NetWare platform. It lets you back up targets such as the file system, Novell eDirectory, and GroupWise® to removable tape media for off-site storage. The NetWare Backup Server has been designed to scale with optimized hardware configurations.

Minimum System Requirements

- ☐ Single processor
- ☐ Server-class PC with a Pentium III 550 MHz or AMD K7 processor
- ☐ 512 MB RAM

Recommended System Requirements

- ☐ Dual processor
- ☐ Server-class PC with a Pentium III 550 MHz or AMD K7 processor
- ☐ 1 GB RAM

The NetWare Backup Server option extends the schema for SMS and creates a dedicated NetWare Backup Server by copying only the files needed, including those for the following products:

- ♦ Apache 2 Web Server and Tomcat 4 Servlet Container
- ♦ Novell iManager
- ♦ Files installed by default. See [Table 4-2 on page 48](#).

For information about configuring SMS after the installation, see the [OES 2 SP1: Storage Management Services Administration Guide](#).

After selecting this option, click *Next* and then proceed to [Section 4.8, “Verifying Pattern Selection,” on page 61](#).

4.6.9 QuickFinder Server

This option installs the Novell QuickFinder Server, a search engine capable of indexing Web site and file server content. QuickFinder lets you easily add search functionality to your network and Web sites.

Minimum System Requirements

- ☐ Single processor

- ☐ Server-class PC with a Pentium III 550 MHz or AMD K7 processor
- ☐ 512 MB RAM

Recommended System Requirements

- ☐ Dual processor
- ☐ Server-class PC with a Pentium III 550 MHz or AMD K7 processor
- ☐ 1 GB RAM

The QuickFinder Server option creates a QuickFinder server by copying only the files needed, including those for the following products:

- ♦ Apache 2 Web Server and Tomcat 4 Servlet Container
- ♦ QuickFinder Server
- ♦ Files installed by default. See [Table 4-2 on page 48](#).

For information about configuring QuickFinder after the installation, see the *OES 2: Novell QuickFinder Server 5.0 Administration Guide*.

After selecting this option, click *Next* and then proceed to [Section 4.8, “Verifying Pattern Selection,” on page 61](#).

4.6.10 Network Attached Storage (NAS) Server

This option gives you multiple file protocol storage for your network. NetWare supports native File Access protocols (NFAPs), including Windows Networking (CIFS), Novell Networking (NCP™), UNIX/Linux Networking (NFS), Macintosh Networking (AFP), and Web Storage (HTTP, HTTPS, FTP, and WebDAV). Multiplatform clients and application servers can access storage using their native protocols. This deployment includes NetStorage, which allows for Web-based sharing of and access to files. From any Web client, or through WebDAV for sharing, all your data is securely accessible. OES NetWare is able to drop into and integrate with any of these environments seamlessly, as well as bridge these environments together.

Minimum System Requirements

- ☐ Single processor
- ☐ Server-class PC with a Pentium III 550 MHz or AMD K7 processor
- ☐ 512 MB RAM

Recommended System Requirements

- ☐ Dual processor
- ☐ Server-class PC with a Pentium III 550 MHz or AMD K7 processor
- ☐ 1 GB RAM

The Network Attached Storage (NAS) Server option creates a NAS server by copying only the files needed, including those for the following products:

- ♦ Apache 2 Web Server and Tomcat 4 Servlet Container
- ♦ NetWare FTP Server

- ♦ Novell NetStorage
- ♦ Files installed by default. See [Table 4-2 on page 48](#).

For information about configuring netstorage after the installation, see the *OES 2: NetStorage for NetWare Administration Guide*.

After selecting this option, click *Next* and then proceed to [Section 4.8, “Verifying Pattern Selection,” on page 61](#).

4.6.11 Novell iPrint Server

This option installs Novell's recommended print solution. Novell iPrint lets users install printers and manage print jobs using an existing Internet connection and a Web browser. iPrint generates a Web page containing a list of available printers and lets administrators create maps with printer locations that aid users in finding the printer closest to them.

Minimum System Requirements

- ☐ Single processor
- ☐ Server-class PC with a Pentium III 550 MHz or AMD K7 processor
- ☐ 512 MB RAM

Recommended System Requirements

- ☐ Dual processor
- ☐ Server-class PC with a Pentium III 550 MHz or AMD K7 processor
- ☐ 1 GB RAM

The Novell iPrint Server option installs and creates a dedicated iPrint server by copying only the files needed, including those for the following products:

- ♦ Apache 2 Web Server and Tomcat 4 Servlet Container
- ♦ iPrint
- ♦ Novell iManager
- ♦ Files installed by default. See [Table 4-2 on page 48](#).

For information about configuring iPrint after the installation, see the *OES 2 SP1: iPrint Administration Guide for NetWare*.

After selecting this option, click *Next* and then proceed to [Section 4.8, “Verifying Pattern Selection,” on page 61](#).

4.6.12 Apache/Tomcat Server

This option lets you deploy and host servlets and Java Server Pages (JSPs). It installs Apache Web Server 2.0 and the Jakarta-Tomcat Servlet Container 4.1 for use in hosting dynamic, application-driven Web sites. Novell eDirectory Java LDAP beans are also included to provide a broad range of eDirectory authentication and identity mechanisms that are customized for use in setting up browser-based access to protected information.

If you need more functionality than you can get from servlets and JSPs, consider installing the exteNd J2EE Web Application Server pattern instead.

Minimum System Requirements

- ☐ Single processor
- ☐ Server-class PC with a Pentium III 550 MHz or AMD K7 processor
- ☐ 512 MB RAM

Recommended System Requirements

- ☐ Dual processor
- ☐ Server-class PC with a Pentium III 550 MHz or AMD K7 processor
- ☐ 1 GB RAM

The Apache/Tomcat Server option creates an Apache/Tomcat server by copying only the files needed, including those for the following products:

- ♦ Apache 2 Web Server and Tomcat 4 Servlet Container
- ♦ MySQL
- ♦ Novell eGuide
- ♦ Novell iManager
- ♦ Files installed by default. See [Table 4-2 on page 48](#).

For information about configuring the Apache Web Server after the installation, see the *Apache Web Server for NetWare Administration Guide for OES*.

For information about configuring Tomcat after the installation, see the *Tomcat for NetWare Administration Guide for OES*.

After selecting this option, click *Next* and then proceed to [Section 4.8, “Verifying Pattern Selection,” on page 61](#).

4.6.13 iSCSI SAN Storage Server

This option creates an iSCSI Storage Server (also known as an iSCSI Target) out of an OES NetWare server. The iSCSI Storage Server includes LDAP access control so you can limit the servers on the iSCSI SAN that can access the storage on the iSCSI Storage Server.

iSCSI is an industry standard that lets you build low-cost, fully functional Storage Area Networks (SANs) using commodity LAN (Ethernet) hardware.

TIP: Improved storage system performance is possible with Gigabit Ethernet hardware.

With iSCSI, existing direct-attached or SAN-attached servers can be redeployed as iSCSI Storage Servers. This lets you improve the manageability and deployment of your storage while also adding high availability with Novell Cluster Services™, which Novell’s iSCSI Storage Server fully supports.

Minimum System Requirements

- ☐ Single processor
- ☐ Server-class PC with a Pentium III 550 MHz or AMD K7 processor
- ☐ 512 MB RAM

Recommended System Requirements

- ☐ Dual processor
- ☐ Server-class PC with a Pentium III 550 MHz or AMD K7 processor
- ☐ 1 GB RAM

The iSCSI SAN Storage Server option creates a dedicated iSCSI SAN Storage server by copying only the files needed, including those for the following products:

- ♦ iSCSI Target
- ♦ Files installed by default. See [Table 4-2 on page 48](#).

For information about configuring the iSCSI SAN Storage Server after the installation, see the *OES 2 SP 1: iSCSI 1.1.3 for NetWare Administration Guide*.

After selecting this option, click *Next* and then proceed to [Section 4.8, “Verifying Pattern Selection,” on page 61](#).

4.6.14 Novell iFolder Storage Services

This option installs Novell iFolder, a software solution that allows your users' files to follow them across multiple workstations and the Internet. With iFolder, each user has a single virtual work folder that provides convenient and secure access to the most recent version of his or her documents. All the user needs is an active Internet connection and the iFolder client or a Web browser. The iFolder server helps guard against local data loss by automatically backing up user's local files to the iFolder server, making them available for regularly scheduled data backup.

Minimum System Requirements

- ☐ Single processor
- ☐ Server-class PC with a Pentium III 550 MHz or AMD K7 processor
- ☐ 512 MB RAM

Recommended System Requirements

- ☐ Dual processor
- ☐ Server-class PC with a Pentium III 550 MHz or AMD K7 processor
- ☐ 1 GB RAM

The Novell iFolder Storage Services option extends the eDirectory schema for iFolder and creates a dedicated iFolder server by copying only the files needed, including those for the following products:

- ♦ Apache 2 Web Server and Tomcat 4 Servlet Container

- ♦ Novell iFolder Storage Services
- ♦ WAN Connectivity
- ♦ Files installed by default. See [Table 4-2 on page 48](#).

For information about configuring Novell iFolder 2.1 after the installation, see the *OES 2 SP1: Novell iFolder 2.1 Installation and Administration Guide*.

After selecting this option, click *Next* and then proceed to [Section 4.8, “Verifying Pattern Selection,” on page 61](#).

4.6.15 Management Server

This option installs Novell iManager 2.7 and Novell ConsoleOne 1.3.6 network administration software. Both products together provide a complete management solution for your OES NetWare server.

Novell iManager 2.7 provides a single Web-based management console for the administration of Novell products in OES. iManager standardizes all Novell Web-based administration utilities on a single management framework. iManager also provides a best-of-breed architecture for easy development of Web-based administration and management modules through open standard application interfaces.

Novell ConsoleOne 1.3.6 is the latest version of Novell’s Java-based GUI network management application.

Minimum System Requirements

- ☐ Single processor
- ☐ Server-class PC with a Pentium III 800 MHz processor
- ☐ 512 MB RAM
- ☐ IDE/SCSI
- ☐ 8 GB hard drive

Recommended System Requirements

- ☐ Dual processor
- ☐ Server-class PC with a Pentium III 1000 MHz processor
- ☐ 1 GB RAM
- ☐ SCSI

Recommended System Requirements for Large Systems

- ☐ Xeon Quad processor
- ☐ 4 GB RAM
- ☐ Fibre Channel/iSCSI

The Management Server option creates a dedicated iManager server by copying only the files needed, including those for the following products:

- ♦ Apache 2 Web Server and Tomcat 4 Servlet Container

- ♦ Novell eGuide (eDirectory Address Book Web Application)
- ♦ Novell iManager
- ♦ iManager plug-ins (.npm files)
- ♦ Files installed by default. See [Table 4-2 on page 48](#).

For information about configuring iManager after the installation, see the *Novell iManager 2.7 Installation Guide*.

After selecting this option, click *Next* and then proceed to [Section 4.8, “Verifying Pattern Selection,” on page 61](#).

4.6.16 Virtual Office Server

This option addresses the need for users to be self-sufficient with their IT needs. Virtual Office lets users set up and manage many of their own networking, information sharing, and data backup processes. It also lets users create project teams, organize projects, and collaborate with team members in real time from any location. Virtual Office optimizes the concept of self service for users, which significantly reduces support calls.

NOTE: Virtual Office was not included in NetWare 6.5 SP5, but it is included in NetWare 6.5 SP6 and SP8. See [Section 2.1.5, “Product-Specific Notes,” on page 17](#) for more information.

Minimum System Requirements

- ☐ Single processor
- ☐ Server-class PC with a Pentium III 550 MHz or AMD K7 processor
- ☐ 512 MB RAM

Recommended System Requirements

- ☐ Dual processor
- ☐ Server-class PC with a Pentium III 550 MHz or AMD K7 processor
- ☐ 1 GB RAM

The Virtual Office Server option creates a Virtual Office server by copying only the files needed, including those for the following products:

- ♦ Apache 2 Web Server and Tomcat 4 Servlet Container
- ♦ iPrint
- ♦ Novell eGuide (eDirectory Address Book Web Application)
- ♦ Novell iFolder Storage Services
- ♦ Novell iManager
- ♦ Novell NetStorage
- ♦ Novell Virtual Office
- ♦ QuickFinder Server
- ♦ WAN Connectivity
- ♦ Files installed by default. See [Table 4-2 on page 48](#).

For information about configuring Virtual Office after the installation, see the *Novell Virtual Office Configuration Guide*.

After selecting this option, click *Next* and proceed to [Section 4.8, “Verifying Pattern Selection,” on page 61](#).

4.7 Verifying Products to Install

After selecting the components that you want to install from the Components page, a Summary page appears displaying the names of the selected products and the disk space (in MB) required to install them.

- 1 To change your product selection, click *Back* and make the necessary changes. After verifying the product names and space requirements, click *Copy Files*.
- 2 (Conditional, if installing from CD) When prompted, remove *NetWare 6.5 SP8 CD 1 (Operating System)*, insert *NetWare 6.5 SP8 CD 2 (Products)*, and click OK.
- 3 Proceed to [Section 4.9, “Naming and Configuring the Server,” on page 61](#).

4.8 Verifying Pattern Selection

After you select the special-purpose server that you want to install, a Details page appears, displaying a description of the selected pattern and the system requirements needed to successfully deploy it.

- 1 To change your pattern selection, click *Back* and make the necessary changes. After verifying the description and system requirements for your selected pattern, click *Copy Files*.
- 2 (Conditional, if installing from CD) When prompted, remove *NetWare 6.5 SP8 CD 1 (Operating System)*, insert *NetWare 6.5 SP8 CD 2 (Products)*, and click OK.
- 3 Proceed to the next section, [Naming and Configuring the Server](#).

4.9 Naming and Configuring the Server

- ♦ [Section 4.9.1, “Naming the Server,” on page 61](#)
- ♦ [Section 4.9.2, “Making Optional Configuration Changes,” on page 62](#)

4.9.1 Naming the Server

The OES NetWare server name must be unique from all other servers in the eDirectory tree. The name can be between 2 and 47 alphanumeric characters and can contain underscores (_) and hyphens (-), but no spaces or periods (.).

IMPORTANT: The server name must be different from the name that you plan to use for the eDirectory tree.

- 1 On the Server Properties page, type the server name in the field provided.
- 2 (Optional) Make changes to the server configuration.

See [Section 4.9.2, “Making Optional Configuration Changes,” on page 62](#).

- 3 When you have finished making configuration changes, click Next on the Server Properties page.

4.9.2 Making Optional Configuration Changes

- ♦ [“Editing the Config.sys File” on page 62](#)
- ♦ [“Editing the Autoexec.bat File” on page 62](#)
- ♦ [“Specifying the Server’s ID Number” on page 62](#)
- ♦ [“Selecting Language Options” on page 63](#)

Editing the Config.sys File

At this stage of the installation, you can make changes or additions to the server’s `config.sys` file.

- 1 On the Server Properties page, click *Advanced*.
- 2 Select the *Edit Config.sys* tab.
- 3 Type the desired information into the `config.sys` field on the right side of the page.
- 4 Click *OK*.
- 5 Continue making optional configuration changes

or

If you have finished making configuration changes, click Next on the Server Properties page.

Editing the Autoexec.bat File

At this stage of the installation, you can make changes or additions to the server’s `autoexec.bat` file.

- 1 On the Server Properties page, click *Advanced*.
- 2 Select the *Edit Autoexec.bat* tab.
- 3 Type the desired information into the `autoexec.bat` field on the right side of the page.
- 4 Click *OK*.
- 5 Continue making optional configuration changes

or

If you have finished making configuration changes, click Next on the Server Properties page.

Specifying the Server’s ID Number

The server requires a unique identification number for IP/IPX™ and IP with Compatibility Mode configurations. Changing the server ID number during this portion of the installation places the new server ID number in the `autoexec.ncf` file. The new server ID number takes effect after you reboot the server.

- 1 On the Server Properties page, click *Advanced*.
- 2 Select the *Server Properties* tab.

3 Type the desired server ID number into the field provided.

4 Click *OK*.

5 Continue making optional configuration changes

or

If you have finished making configuration changes, click *Next* on the *Server Properties* page.

Selecting Language Options

NetWare can be customized to function in several languages.

1 On the *Server Properties* page, click *Advanced*.

2 Select the *Language* tab.

3 Select the desired server language from the drop-down list.

The server language determines which language the server console and error messages appear in.

4 Select the desired admin language from the drop-down list.

The admin language determines which language the network administrator User object uses to log in to the network. When additional eDirectory objects are created by the administrator, they use the same language as the admin language.

5 In the *Additional Server Languages* field, select the languages you want to install.

You can use NetWare server and client utilities in other languages, if the additional language is installed on the server.

6 Click *OK*.

7 Click *Back* to revise any optional configuration changes you have made.

or

If you have finished making configuration changes, click *Next* on the *Server Properties* page.

4.10 Installing Networking Protocols

NetWare can process IP (Internet Protocol) network packets and traditional IPX (Internetwork Packet Exchange™) packets. Both protocols can be assigned to a single network board, which allows the server to communicate by using IP and IPX.

- ♦ “About the Internet Protocol (IP)” on page 64
- ♦ “About IPX” on page 64
- ♦ “Using Both IP and IPX” on page 65
- ♦ “Installing IP and IPX” on page 65

4.10.1 About the Internet Protocol (IP)

The Internet protocol (IP) lets your network share data with other IP networks, including the Internet. Using IP requires a unique IP address, a subnet, and a router or gateway address.

- ♦ **IP Address:** Identifies each device on the network. The address consists of 32 bits, which are represented as decimal values separated by periods, such as 123.45.67.89.

If your server connects to the Internet, you must obtain a unique IP address. For information on receiving an IP address, contact your Internet service provider (ISP).

- ♦ **Subnet Mask:** Lets you break up your network into smaller networks. Your network might have too many nodes or might be too geographically dispersed to manage as a single network.

Dividing your network into smaller networks allows the network routers to filter and reduce the network activity seen by any of the nodes. However, dividing your network and using several network addresses might not be appropriate on a large network that needs to appear to network administrators as a single network.

- ♦ **Router (Gateway):** The address of the router that connects two different environments, such as a LAN and the Internet.

You can specify a specific router (gateway) address or you can rely on the network to automatically find the nearest router. If you specify the address, remember that the router must exist on your network segment.

Installing IP automatically binds to the Ethernet_II frame type.

When IP is selected, passive support for IPX is also provided to support IPX-based applications without binding IPX. If an IPX request arrives at the server, OES NetWare processes the IPX request. This passive support for IPX is called Compatibility Mode and is automatically enabled to provide service for applications that require IPX.

TIP: You can disable Compatibility Mode by removing the `LOAD SCMD` command from the server's `autoexec.ncf` file. When IPX Compatibility Mode is disabled, the server processes only IP packets. Applications that require IPX do not function properly.

4.10.2 About IPX

The Novell traditional protocol, Internetwork Packet Exchange (IPX), lets you continue using IPX-based applications. If IPX, but not IP, is installed on your server, it actively processes IPX packets and ignores packets using other protocols, such as IP.

During the installation program, existing IPX frame types are detected. The installation program detects one of the following conditions.

- ♦ **A single IPX frame type:** If a single frame type is detected, it is installed.
- ♦ **Multiple IPX frame types:** If detected, you are prompted to choose the frame types that you want to install.
- ♦ **No IPX frame types:** If no frame types are detected, Ethernet_802.2 is installed by default.

4.10.3 Using Both IP and IPX

If you have network clients or applications that require IPX and IP, you can install both protocols. Both protocols can be bound to a single network board. When selected, both IP and IPX protocols are actively supported. The server processes IP requests by using IP, and it broadcasts and replies to IPX requests by using IPX.

4.10.4 Installing IP and IPX

- 1 On the Protocols page, select a network board.
- 2 Select the *IP* check box.
- 3 Type the required IP information for the selected network board.
- 4 Select the *IPX* check box if you are installing IPX on the selected network board.

If you choose to install IP and not IPX, the SERVERID reference is not used and is removed from `autoexec.ncf`. You can add IPX after the server installation by adding the `SERVERID 8_digit_number` command after the `SERVERNAME` command in `autoexec.ncf`.
- 5 Repeat [Step 1](#) through [Step 4](#) for each network board in the server.
- 6 (Optional) Make changes to the protocol configuration.
- 7 When you have finished making protocol configuration changes, click Next on the Protocols page.
 - ♦ [“Configuring SLP” on page 65](#)
 - ♦ [“Configuring SNMP” on page 66](#)
 - ♦ [“Configuring IPX Compatibility” on page 66](#)

Configuring SLP

Service Location Protocol (SLP) is an IETF standard for enabling network-based applications to automatically discover the location, including the address or domain name and other configuration information, of a required service. Using SLP, clients can connect with and make use of services on an IP network. Without SLP, network resources must be manually configured or specified in a separate configuration file.

SLP should be configured properly if the server is going to be a part of a migration using the NetWare Migration Wizard utility from the Server Consolidation and Migration Toolkit.

- 1 On the Protocols page, click *Advanced*.
- 2 Select the *SLP* tab.
- 3 Either specify the IP addresses of the Directory Agents on your network or, if no Directory Agents exist on your network, select the *Configure This Server as a DA* check box.
- 4 If you want to enable multicasting, select the *Enable Multicast Routing on This Server* check box.
- 5 Click *OK*.
- 6 Continue making optional configuration changes
or
If you have finished making configuration changes, click Next on the Protocols page.

Configuring SNMP

Network management utilities use Simple Network Management Protocol (SNMP) to record and communicate information about network devices. You can use an SNMP-compatible utility to set and monitor threshold levels and specific events such as packets per second or error rates. The information is then sent to the destination address of the workstation running the SNMP-compatible management utility.

- 1 On the Protocols page, click *Advanced*.
- 2 Select the *SNMP* tab.
- 3 (Optional) Type a hardware description, server location, and administrator in the fields provided.
- 4 Type the IPX and IP destination addresses of the devices that will receive the SNMP information in the fields provided.
- 5 Click *OK*.
- 6 Continue making optional configuration changes

or

If you have finished making configuration changes, click *Next* on the Protocols page.

Configuring IPX Compatibility

When enabled, IPX compatibility provides passive support for IPX-based applications without binding IPX. Although the server does not broadcast services using RIP and SAP, NetWare processes any IPX request that arrives at the server.

- 1 On the Protocols page, click *Advanced*.
 - 2 Select the *IPX Compatibility* tab.
 - 3 (Conditional) Select the *Load IPX Compatibility* check box. This option is only available if you did not select the IPX check box in **“Installing IP and IPX” on page 65**.
- 3a Type the eight-digit hexadecimal compatibility mode network number in the field provided or accept the default shown.
 - 3b Select the preferred IP address from the drop-down list.
- 4 (Conditional) Select the *Load the Migration Agent on This Server* check box. This option is only available if you checked the IPX box in **“Installing IP and IPX” on page 65**.

NetWare regulates IP and IPX protocols by using a Migration Agent, which regulates the protocol function on different network segments. If a Migration Agent is not enabled, packets are not forwarded onto network segments communicating with a different protocol. For more information, see the online help file associated with this page.

- 4a Type the eight-digit hexadecimal compatibility mode network number in the field provided or accept the default shown.
 - 4b Select the preferred IP address from the drop-down list.
- 5 Click *OK*.
 - 6 Click *Back* to revise any optional configuration changes you have made.

or

If you have finished making configuration changes, click *Next* on the Protocols page.

4.11 Specifying a Hostname for Each IP Address

If you bound two different IP addresses to two or more network boards, the hostnames page displays. If you have only one network board, or you bound two or more network boards with the same IP address, skip to [Section 4.12, “Setting Up Domain Name Service,” on page 67](#).

You must specify a hostname for each of the IP addresses that were bound in [Section 4.10, “Installing Networking Protocols,” on page 63](#). The hostname is the name that your DNS servers resolve to the IP address. If you do not know what hostname to assign, contact your network administrator.

You must also determine which IP address will be the Primary IP address. The Primary IP address will be the default IP address for all TCP/IP services.

- 1 Type a hostname in the field provided for each IP address.
- 2 Select the *Primary* radio button next to the IP address you want to specify as the primary IP address.
- 3 Click *Next*.

4.12 Setting Up Domain Name Service

The IP protocol identifies computers and systems by their assigned IP addresses, such as 123.45.56.89. Domain Name Service (DNS) allows a specific server on the network to maintain a list of simple, readable names that match IP addresses. Applications (or protocols) that require IP addresses rather than names can use a DNS server to translate from one form to another.

TIP: If you do not plan to connect this server to the Internet, you can skip this page and ignore any associated error messages.

- 1 If you want this server to be available to the Internet, provide the following information on the Domain Name Service page:
 - ♦ **Host Name:** The simple, readable name on the DNS server that matches this NetWare 6.5 server's name (or the name that you have bound to the network board).
You can set up the host computer name on the DNS server to use the NetWare server name.

NOTE: If you bound two different IP addresses to two or more network boards in [Section 4.10, “Installing Networking Protocols,” on page 63](#), the *Host Name* field is not displayed on this page. This is because you specified the hostname on the [Specifying a Hostname for Each IP Address](#) page described in the previous step. The remainder of this page remains the same.

- ♦ **Domain Name:** The hierarchical name that represents the organization of your network, such as acme.com.
 - ♦ **Domain Name Server:** The IP address of the DNS server that maintains the list containing this server's simple, readable name and IP address. For more information, contact your network administrator or Internet service provider.
- 2 (Optional) If you want the install to verify the domain name service information for you, select *Verify the DNS Information*.
 - 3 Click *Next*.

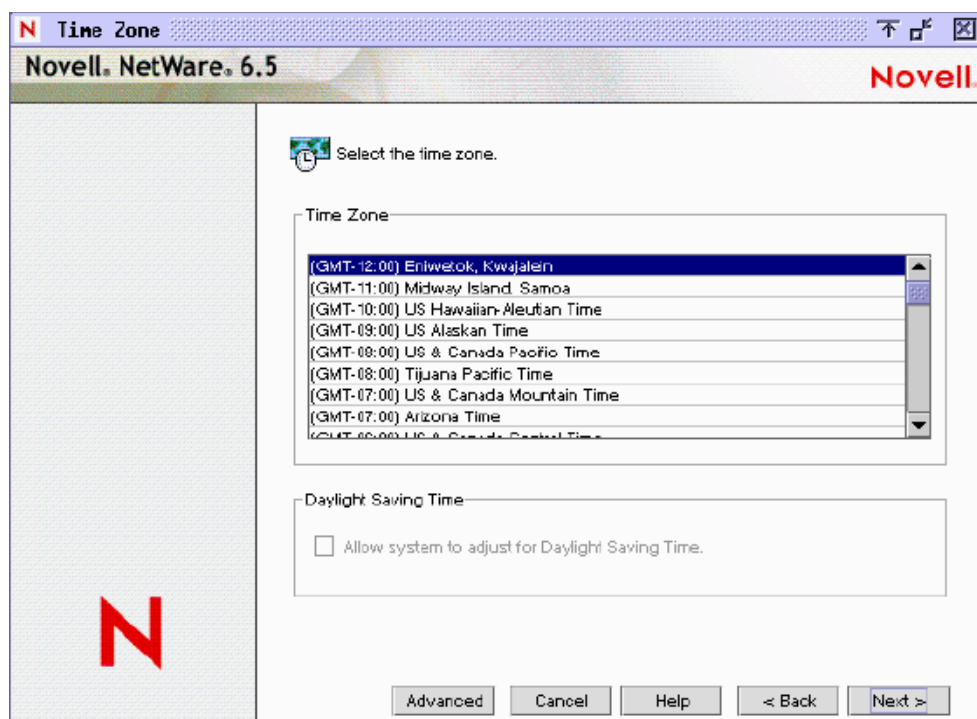
4.13 Setting the Server Time Zone and Time Synchronization Method

Keeping accurate time is a critical function for servers in an eDirectory tree. The reported time must be synchronized across the network in order to provide expiration dates and time stamps to establish the order of events taking place in eDirectory.

- ♦ [Section 4.13.1, “Setting the Server Time Zone,” on page 68](#)
- ♦ [Section 4.13.2, “Configuring Time Synchronization,” on page 68](#)

4.13.1 Setting the Server Time Zone

- 1 On the Time Zone page, select the correct time zone setting from the available list.



- 2 Click the check box if you want the system to adjust automatically for daylight saving time.

By default, the NetWare installation synchronizes time automatically with the first server in the tree. However, you might want to set up a different time synchronization scheme or synchronize with an external time source by using Network Time Protocol (NTP).

To change the default time synchronization settings, continue with the time synchronization configuration instructions in [Section 4.13.2, “Configuring Time Synchronization,” on page 68](#). Otherwise, skip to [Section 4.14, “Setting Up Novell eDirectory,” on page 69](#).

4.13.2 Configuring Time Synchronization

Follow these steps to select and configure the server's time synchronization method:

- 1 On the Time Zone page, click *Advanced*.

- 2 On the Time Synchronization page, click the radio button next to the time protocol that you want.

NetWare servers can use one of two available protocols for time synchronization: NTPv3 or Timesync. Select the protocol that best fits your network's needs.

IMPORTANT: If you are installing NetWare on a Xen virtual machine, select the Timesync method and configure it to also communicate using NTP.

- ♦ Select *NTPv3* to use Network Time Protocol for synchronizing time on your network. (The `xntpd.nlm` that provides NTP time packets is also capable of providing Timesync packets for servers that require them, such as NetWare 5.0 and 4.2 servers.)

If you select this option, further configuration might be required to fully implement your time server hierarchy. For more information, see the *OES 2: Novell NTP for NetWare Administration Guide*.

- ♦ Select *Timesync* to use the legacy time synchronization mechanism built in to NetWare. (The `timesync.nlm` that provides Timesync packets is also capable of providing NTP packets for interoperability with other time servers.)

- 3 If you selected *Timesync*, click the radio button next to the time server type that you want.

NetWare distinguishes four types of time servers. Three of these provide network time: Single Reference, Reference, and Primary. All other servers are called Secondary time servers because they receive their time from the time providers.

The first NetWare server installed in a network is automatically set up as a Single Reference time server. All subsequent NetWare servers are automatically set up as Secondary time servers. This default configuration works well for most small networks. If your network requires a different time synchronization configuration, you can change the time server type. For more information, see the *OES 2: Novell TimeSync for NetWare Administration Guide*.

- 4 (Optional) If you do not want to accept the defaults, configure Timesync time sources by selecting the *Use Timesync Configured Sources* check box.

- 4a Type the time sources in the fields provided (up to three).

Timesync time sources can be specified in one of three different formats:

- ♦ IP Address
- ♦ DNS Name
- ♦ Server Name (IPX required)

- 4b (Conditional) If your time source uses Network Time Protocol (NTP), select the *NTP* check box to the right of the time source.

- 5 Click *OK*.

You are returned to the Time Zone page.

- 6 Click *Next*.

4.14 Setting Up Novell eDirectory

Novell eDirectory provides global access to all networking resources. eDirectory allows users with the proper access rights to log in to the network and view and access network resources.

Network resources such as servers and printers are presented hierarchically in an eDirectory tree. Users log in to the eDirectory tree with a single login name and password instead of logging in to specific servers.

Before completing this task, you should understand some basic concepts relating to eDirectory trees, containers, and contexts:

- ♦ **Tree Name:** The top level of the available network resources. It must be unique from other eDirectory tree names on the network.
- ♦ **Containers:** Much like subdirectories, containers contain network objects. The server can be installed into two types of container objects: Organization (O) and Organizational Unit (OU).
- ♦ **Context:** The context, much like DOS directory paths, denotes the full path of a network object in the eDirectory tree. For example, a NetWare server might be installed into an Organizational Unit (OU) named Sales under the Organization (O) named Acme. The context would be denoted as OU=Sales.O=Acme or Sales.Acme.

- ♦ **Installing the Server into an Existing eDirectory Tree (page 70)**

- ♦ **Creating a New eDirectory Tree (page 71)**

- 1 Click the radio button next to the eDirectory option you want.

- ♦ *Installing the Server into an Existing eDirectory Tree*
- ♦ *Creating a New eDirectory Tree*

- 2 Click *Next*.

- 3 Continue with the section below that corresponds to your choice.

4.14.1 Installing the Server into an Existing eDirectory Tree

Installing your server into an existing eDirectory tree incorporates the server into your network.

The server can be installed in any Organization (O) or Organizational Unit (OU) container in the eDirectory tree where you have the Supervisor right. You can create containers during the installation.

- 1 Type the tree name in the field provided.
- 2 Type the context for the server object in the field provided.
- 3 Click *Next*.
- 4 Type the full eDirectory context for the Admin object.
- 5 Type the password for the Admin object.
- 6 Click *OK*.

IMPORTANT: If this is the first NetWare server to be installed into an existing eDirectory tree, you are asked if you have run the Deployment Manager as described in [Section 2.5, “Using Deployment Manager,” on page 26](#).

If you have not run the Deployment Manager, you can run it on a workstation, return to the server console, and click *Yes*, or you can click *No*, cancel the installation, run Deployment Manager, then restart the installation. Deployment Manager is located at the root of the *NetWare 6.5 SP8 CD 1 (Operating System)* CD or DVD and is run from a Windows workstation.

If you have updated the eDirectory tree on all servers but have not yet prepared the network for NDS 8, you are prompted to modify the schema. When prompted, you must provide the administrator name and password for the entire eDirectory tree.

4.14.2 Creating a New eDirectory Tree

Create a new tree if you are creating a new network or if this server requires a separate eDirectory tree. The resources available on the new tree are only available to users logged in to the new tree.

- 1 Type a tree name.
Each eDirectory tree must have a name unique from other eDirectory trees on the network.
- 2 Type the context for the Server object in the field provided or browse to the context by clicking the *Browse* button.
If you click the *Browse* button, you can add or delete containers in your tree.
- 3 Type the context for the default Admin user.
- 4 Type a password for the Admin user.
- 5 Retype the password for the Admin user.
- 6 Click *Next*.

4.14.3 eDirectory Summary

The eDirectory Summary page is now displayed. Now that you have created a new eDirectory tree or installed the server into an existing eDirectory tree, the NetWare Server object and Volume objects will be installed in the container you specified.

If you have created a new eDirectory tree, a user (default name Admin) with the Supervisor right to the eDirectory tree is created in the same eDirectory container as the NetWare Server object.

- 1 Verify that the information on the eDirectory Summary page is accurate.
- 2 Record the Admin password and any other relevant information before proceeding.
- 3 Click *Next*.

4.15 Licensing the NetWare Server

Every NetWare server must have a valid license for the number of users who access the server. You have two licensing options when installing a server:

- ♦ Use the MLA license included on the NetWare installation CDs in the `/LICENSE` folder.

You can use the same license files for all NetWare servers.

- ♦ Install without licenses: You can install the server without licenses; however, an unlicensed server allows only two user connections.

After installation, you can use the Novell iManager utility to install the MLA license included on the installation media.

To use iManager to install the MLA license:

- 1 From a Windows or Linux machine, use the iManager plug-in to connect to the NetWare server.

NOTE: The licensing plug-in for iManager is incompatible with the Novell browser found on the server. You must use a Windows or Linux machine to connect to the server through iManager.

1a Open a Web browser to the following URL:

`https://svrname.example.com/nps/iManager.html`

1b Replace *svrname.example.com* with the actual DNS name or IP address (such as 192.168.1.1) of the NetWare server.

1c On the iManager Login page, log in as an Admin user or equivalent.

2 Continue with the steps given in the “**Installing License Certificates**” section in the *OES2 SP1: Licensing Services for NetWare Administration Guide*.

To implement the licensing option of your choice:

- 1** (Optional) If you want to install the server without licenses, select *Install Without Licenses* and click *Next*. Skip to **Section 4.16, “LDAP Configuration,” on page 72**.
- 2** To install the server with a license, click the *Browse* button and browse to the location of the MLA license file on either of the NetWare installation CDs in the /LICENSE folder.
- 3** Select the desired .nlf file, then click *OK*.
- 4** Click *Next*.
- 5** (Conditional) If prompted, select where in the tree you want to install the license, then click *Next*.

For instructions on how to delete or install licenses by using iManager after the server installation, see **Section 4.25.2, “Installing NetWare Licenses,” on page 77**.

4.16 LDAP Configuration

If you selected a Manual Installation at the beginning of the OES NetWare installation, (see **“Selecting Default or Manual Installation” on page 41**), you now see the LDAP Configuration page. On this page, you can configure LDAP on the server. If you are not performing a manual install, continue with **Section 4.17, “Selecting the Login Method,” on page 72**.

- 1** Specify the ports for *Clear Text* and *SSL/TLS*, or accept the defaults provided.
- 2** Select *Require TLS for Simple Bind with Password* if you want that feature activated.
- 3** Click *Next*.

4.17 Selecting the Login Method

NMAS server components are installed automatically when you run the NetWare installation program. You need to select the login methods you want to install.

Select the login methods that you want to install into eDirectory by selecting the appropriate check boxes on the Novell Modular Authentication Service page. When you select a login method, a description of the component appears in the *Description* box. For more information on login methods, see **“Managing Login and Post-Login Methods and Sequences” in the *Novell Modular Authentication Services 3.3.1 Administration Guide***.

The NDS and Challenge Response login methods are installed by default.

- 1 On the Novell Modular Authentication Service page, select the login methods you want to use from the options provided.

Select *Select All* if you want to install all the login methods into eDirectory. Select *Clear All* if you want to clear all selections (except for the NDS and Challenge Response defaults).

- 2 Click *Next*.

IMPORTANT: The NMAS client software must be installed on each client workstation where you want to use the NMAS login methods. The NMAS client software is included with the Novell Client™ software.

4.18 DNS/DHCP Installation

If you selected to install DNS/DHCP on the Components page or if you selected a pattern installation that installs DNS/DHCP, you now see the DNS/DHCP Installation page. If you did not select DNS/DHCP on the Components page, continue with [Section 4.19, “iFolder Server Options,” on page 73](#).

You must specify the eDirectory context of three different items on this page. They are:

- ♦ DNS/DHCP Locator Object
- ♦ DNS/DHCP Group Object
- ♦ RootSrvr Zone

All three fields are populated with a default context. To change the context from the default:

- 1 Click the *Tree* button to the right of the context field.
- 2 Browse to and select the context that you want, then click *OK*.
- 3 Click *Next*.

4.19 iFolder Server Options

If you selected to install Novell iFolder Storage Services on the Components page or if you selected a pattern installation that installs iFolder, you now see the iFolder Server Options page. If you did not select Novell iFolder Storage Services on the Components page, continue with [Section 4.20, “MySQL Options,” on page 74](#).

There are six fields on this page that have values that can be modified. They are:

- ♦ **LDAP Host Name or IP:** The DNS name or IP address of the server that acts as your eDirectory LDAP server.
- ♦ **LDAP Port, 389 (Clear Text) 636 (SSL):** The LDAP port type that you want to use, based on your security needs, for data exchanges between your LDAP server and your iFolder server.
- ♦ **LDAP Context for Admins:** The LDAP context of the container where your iFolder Admin User objects are located.
- ♦ **iFolder Server Host Name or IP:** The DNS name or IP address of your iFolder server. The DNS name or IP address you provide must enable the iFolder server to be accessed from the users' computers.

- ♦ **iFolder Admin Names:** The default user ID for the iFolder administrator for this iFolder server. You can assign more than one user ID to be an iFolder administrator. If you are specifying more than one name, separate them with semicolons and with no spaces. All entries cannot exceed 256 characters, including the semicolons. For example: admin;jsmith;jdoe.
 - ♦ **User Database Path:** The path to the directory on the iFolder server where user data for all the iFolder accounts will be stored.
- 1 Modify any of the server options for iFolder that are displayed on the page or accept the default settings that are provided.
 - 2 Click *Next*.

4.20 MySQL Options

If you selected to install MySQL on the Components page or if you selected a pattern installation that installs MySQL, you now see the MySQL Options page. If you did not select MySQL on the Components page, continue with [Section 4.21, “exteNd Application Server Details,” on page 74](#).

- 1 Click the *Browse* icon to browse to the directory where you want the MySQL databases to be stored.

The database must reside on an NSS volume. The default location is `sys:/mysql/data`.

- 2 Type the root password in the field provided.

The MySQL root user is created as a supervisor who can do anything. Specifying a password for the MySQL root user is recommended. If the root password field is left empty, anyone can connect as root without a password and be granted all privileges.

- 3 Confirm the root password in the field provided.

This password must match the password specified in the previous field.

- 4 (Optional) Select *Secure Installation* if you want to enable secure installation.

By default, the root user can connect either from the local host or remotely. An anonymous user is also created that can connect from the local host or remotely and do anything with databases that have a name of “test” or starting with “test_”. This means any local user can connect without a password and be treated as the anonymous user. A test database is also created.

If this box is selected, the root user is only allowed to connect from the local host, a root password is required, and the anonymous user and the test database are not created.

- 5 Click *Next*.

4.21 exteNd Application Server Details

If you selected to install the exteNd Application Server on the Components page or if you selected a pattern installation that installs exteNd, you now see the exteNd Application Server - Details page. This page specifies some basic settings about the application server's configuration. If you did not select exteNd Application Server on the Components page, continue with [Section 4.23, “NetStorage Install,” on page 75](#).

- 1 Type the username for the application server’s administration account in the field provided.

The install creates a user with this name and assigns Locksmith privileges to it. To better secure the application server, specify a username other than the default (admin).

- 2 Type the password for the Admin name in the field provided.

To better secure the application server, specify a password other than the default (admin).

- 3 Confirm the password in the field provided.
- 4 Type the HTTP port number that the application server will listen on in the field provided.

By default, port 80 is used by the Apache HTTP Server installed with NetWare. However, when the application server's Web Server Integration (WSI) module for Apache is in use, it redirects requests from the Apache server (listening on port 80) to the application server (port 83).

- 5 Select *Restrict Access* if the application server is to be initially configured to restrict user access.

For more information on restricting access, click the *Help* button.

- 6 Click *Next*.

4.22 exteNd Application Server Database Options

You now see the exteNd Application Server - Database Options page. This page specifies settings for configuring the MySQL database to be used as the application server's SilverMaster. If you did not select exteNd Application Server on the Components page, continue with [Section 4.23, "NetStorage Install," on page 75](#).

- 1 Type the name of the machine hosting the MySQL database in the field provided. Localhost is the default.
- 2 Type the port number for the MySQL database on the host machine in the field provided. 3306 is the default.
- 3 Type the MySQL user name to be used by the application server when logging in to the database.

The install creates a user with this name in the MySQL database and grants that user rights to the SilverMaster system tables needed by the application server. To better secure the MySQL database, specify a user name other than the default (appserver).

- 4 Type the password for the database user name in the field provided.
To better secure the MySQL database, specify a password other than the default (appserver).
- 5 Confirm the password in the field provided.
- 6 Type the name of the MySQL database in the *SilverMaster Name* field provided. SilverMaster50 is the default.

- 7 Select *Execute SilverMasterInit* if you want to populate the MySQL database with the SilverMaster system tables needed by the application server.

This option is selected by default. Keep the SilverMasterInit setting selected unless this install is for a secondary application server in a cluster.

- 8 Click *Next*.

4.23 NetStorage Install

If you did not select Novell NetStorage on the Components page, continue with [Section 4.24, "Completing the Server Installation," on page 76](#).

If Novell NetStorage was one of the products you selected to install on the Components page, or if you selected a pattern installation that installs NetStorage, you now see the NetStorage Install page. NetStorage provides simple access to file storage on a Novell network from any Internet-enabled machine.

- 1 Type the IP address or DNS name of a server in your eDirectory tree that has the master replica or a read/write replica of eDirectory in the field provided.
- 2 (Optional) Type the IP addresses or DNS names of servers in other eDirectory trees that have at least read/write eDirectory replicas, or specify the same IP address or DNS name you used for the primary eDirectory server but with a different context.

You can add two alternate eDirectory server URL and context settings. These alternate settings are used to allow NetStorage to find User objects that exist in contexts other than what you specified for the primary eDirectory server. The alternate settings also allow NetStorage to find user objects with the same name in different eDirectory trees. The alternate URL and context settings are optional, but can help provide users with an additional level of access to netstorage.

- 3 (Optional) Type the IP address or DNS name and the port number that you assigned to Novell iFolder in the fields provided.

The iFolder DNS name or IP address and the port number are optional, but if they are specified, they allow NetStorage users to access and manipulate files and directories on the iFolder server.

- 4 Click *Next*.

4.24 Completing the Server Installation

After the installation is finished, remove the *NetWare 6.5 SP8 CD 2 (Products)* or *NetWare 6.5 SP8 DVD* and click *Yes* to restart the server.

If you selected to load the server on reboot, the NetWare server software automatically loads when the computer reboots.

If you selected to not load the server on reboot, you can load it manually. To load the server manually, reboot the computer by clicking *Yes*. When the computer reboots, change to the startup directory containing the NetWare server files (`c:\nwserver`) and enter `SERVER`.

Your NetWare server installation is now complete. In addition to installing the products necessary for your server to run as designed, two volumes were created on the server: `sys:` and `_admin:`. These volumes are required for the server to function and must not be deleted.

Continue with [Section 4.25, “Completing Post-Installation Tasks,” on page 76](#).

4.25 Completing Post-Installation Tasks

After installing your NetWare server, you should install the latest software updates. You can also install additional products or services and configure them to work in the new environment.

This section covers the following post-installation tasks:

- ♦ [Section 4.25.1, “Accessing the Welcome Page,” on page 77](#)
- ♦ [Section 4.25.2, “Installing NetWare Licenses,” on page 77](#)
- ♦ [Section 4.25.3, “Creating eDirectory Objects for Existing Volumes,” on page 77](#)
- ♦ [Section 4.25.4, “Installing or Updating Novell Client Software,” on page 78](#)

- ♦ Section 4.25.5, “Installing Product Updates,” on page 78
- ♦ Section 4.25.6, “Installing Additional Products,” on page 78
- ♦ Section 4.25.7, “Other Post-Installation Tasks,” on page 79
- ♦ Section 4.25.8, “For Additional Information,” on page 79

4.25.1 Accessing the Welcome Page

The OES NetWare Welcome page provides helpful information for getting the most out of your new NetWare server. To access the Welcome page, open a browser on a workstation with access to the new server and point it to `http://IP_address`, where *IP_address* is the new server’s IP address.

IMPORTANT: Apache and Tomcat must be installed on the server in order for the Welcome page to be displayed. If you chose a Basic server installation, or a Customized installation without these two components, the Welcome page is not displayed.

4.25.2 Installing NetWare Licenses

If you installed your server with no license, you must install the MLA license on the installation media before using the server.

If you installed a server for evaluation and the 90-day evaluation period has elapsed, Novell expects you to purchase a standard paper license if you intend to continue using the server. Contact your Novell Authorized ResellerSM for more information.

To install a NetWare license as a post-installation task:

- 1 On a workstation that has access to the server, start iManager by pointing the browser to the following URL:

`http://IP_address/iManager.html`

Substitute the new server’s IP address for *IP_address*.

- 2 Select *Licenses > Install a License*.
- 3 Browse to the `/LICENSE` folder on the installation media, then click *Next*.
- 4 Select the license certificates you want to install, then click *Next*.
- 5 Browse to the location in the tree where you want to install the license, then click *Install*.
- 6 When you see the message verifying that the license has been installed, click *Done*.

4.25.3 Creating eDirectory Objects for Existing Volumes

If you installed NetWare on a server with existing NSS or traditional NetWare volumes, the install did not create eDirectory objects in the tree for the existing volumes. You must mount the preexisting volumes, then create an eDirectory object for each volume.

To create an eDirectory object for an NSS volume by using iManager:

- 1 Launch iManager on your workstation.
- 2 In the Roles and Tasks view, select *Storage > Volumes*.
- 3 In the Server field, specify the fully distinguished name of the server you just installed.

The existing volumes for the server are displayed in the Volumes list.

- 4 Select the volume you want to create an eDirectory object for.
- 5 Click the *Mount* button.
- 6 Click the *Update eDirectory* button.

To create an eDirectory object for an NSS volume by using NSSMU:

- 1 Enter `nssmu` at the server console.
- 2 Select *Volumes*, then press Enter.
- 3 Select the volume that needs to have an eDirectory object created for it.
- 4 To update eDirectory with the new Volume object, press F8 > Alt+F8.

To create an eDirectory object for a traditional volume by using Novell Remote Manager:

- 1 Launch Novell Remote Manager on your workstation.
- 2 Click the Plus sign (+) to the left of the Manage Server heading to expand the menu, then select *Partition Disks*.
- 3 Locate the volume you want to create an object for and click *Create eDir Object* next to the desired volume.

The *Create eDir Object* link disappears after the object is created.

4.25.4 Installing or Updating Novell Client Software

If you are running Novell Client software, you should upgrade your existing workstations to the latest version. You can also choose to run workstations without additional software by using Novell Native File Access Protocols.

For more information, see the *Novell Client online documentation* (<http://www.novell.com/documentation/noclienu>).

4.25.5 Installing Product Updates

For best reliability and performance, you should download and install the latest product updates available at the *Novell Downloads site* (<http://download.novell.com>).

4.25.6 Installing Additional Products

After the initial installation, you can install other networking products on your NetWare server. For specific product information, see the product documentation in the *Open Enterprise Server 2 online documentation* (<http://www.novell.com/documentation/oes2>).

Although many products can be installed during the Customized NetWare Server installation, some additional products such as Novell Cluster Services™ can be installed only after completing the server installation. You can install additional products remotely by using Novell Deployment Manager or locally from the GUI server console.

IMPORTANT: When installing additional products through the post-install procedure, make sure you use the same version overlay CDs as the version of NetWare on the server. If the server is running OES/NetWare 6.5 SP8, you must use the SP8 overlay CDs.

- ♦ [“Using Deployment Manager to Install Additional Products” on page 79](#)
- ♦ [“Using the GUI Server Console to Install Additional Products” on page 79](#)

Using Deployment Manager to Install Additional Products

- 1 Log in to the network from a Windows workstation running Novell Client software.
- 2 Run `nwdeploy.exe` (or `nwdeplownobrowser.exe` for the non-browser version), located at the root of *NetWare 6.5 SPx CD 1 (Operating System)*.
- 3 Under *Post-Install Tasks*, click the *Install NetWare 6.5 Products* link.
- 4 Follow the on-screen instructions for adding the desired products.

Using the GUI Server Console to Install Additional Products

- 1 Insert *NetWare 6.5 SPx CD 2 (Products)* into the CD drive of the server.
- 2 (Conditional) If necessary, start the GUI server console page by entering `startx` at the console prompt.
- 3 Click *Novell > Install*.
- 4 Click *Add*.
- 5 Specify the root directory of the CD and click OK.
- 6 Select the `postinst.ni` file.
- 7 Follow the on-screen instructions for installing the product.

4.25.7 Other Post-Installation Tasks

After completing the NetWare installation, you can run Deployment Manager again and click the links under the Post-Install Tasks heading for information on:

- ♦ [Creating additional volumes](#) to increase the storage capacity of your server
- ♦ [Using DSREPAIR](#) to monitor and repair problems with eDirectory

4.25.8 For Additional Information

For further information on the management of your server's operating system, see the [OES2 SP1: Server Operating System for NetWare Administration Guide](#).

For information on using Novell iManager to manage your network see the [Novell iManager 2.7 Installation Guide](#).

Installing and Managing OES 2 SP1 NetWare on a Xen-based VM Host Server

5

IMPORTANT: OES 2 SP1 NetWare has been modified to run in paravirtual mode on a Xen virtual machine. Running NetWare in fully virtualized mode on a Xen host server is not supported.

You can install OES 2 SP1 NetWare® as a virtual machine guest (VM guest) operating system on a.

- ♦ SUSE® Linux Enterprise Server (SLES) 10 Linux server

See “*Setting Up a Virtual Machine Host* (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.

or an

- ♦ OES 2 SP1 Linux server that has been set up as a Xen-based host server

See “*Installing OES 2 SP1 Linux as a Xen VM Host Server*” in the *OES 2 SP1: Linux Installation Guide*.

For general information on the Xen virtualization technology in SLES 10 SP2, see the *Virtualization with Xen* (http://www.novell.com/documentation/sles10/xen_admin/data/bookinfo.html) guide.

This section documents the system requirements, installation instructions, upgrade and migration instructions, and issues associated with setting up NetWare on a Xen-based virtual machine.

- ♦ [Section 5.1, “Introduction,” on page 81](#)
- ♦ [Section 5.2, “Support Information,” on page 82](#)
- ♦ [Section 5.3, “Preparing to Install a NetWare VM Guest Server,” on page 83](#)
- ♦ [Section 5.4, “Installing Virtualized NetWare,” on page 85](#)
- ♦ [Section 5.5, “Managing NetWare on a Virtual Machine,” on page 92](#)

5.1 Introduction

There are many reasons to install NetWare on virtual machines, such as:

- ♦ Incorporating an OES 2 SP1 NetWare server into a production environment without committing additional hardware resources.
- ♦ Isolating Novell iFolder®, iPrint, GroupWise®, or other applications to a single virtual server without committing additional hardware resources.
- ♦ Extending the useful life of NetWare services by running them on a Linux host server, thereby taking advantage of the widespread industry support for Linux hardware drivers.

To simplify the process of installing virtualization software, the SLES 10 SP2 software includes *Xen Virtual Machine Host Server* as a primary server function that you can select when installing SLES 10 SP2 as a virtualization host server.

Selecting this pattern installs the Xen host server software, which enables the server to boot the Xen version of the SLES 10 SP2 operating system kernel. It also installs utilities for preparing and creating virtual machines.

After the host server is up and running, you can then create a virtual machine and install OES 2 SP1 NetWare as a guest operating system.

5.2 Support Information

- ♦ [Section 5.2.1, “OES 2 Registration Is Required for Support,” on page 82](#)
- ♦ [Section 5.2.2, “Supported Configurations and Features,” on page 82](#)
- ♦ [Section 5.2.3, “Unsupported Configurations and Features,” on page 82](#)

5.2.1 OES 2 Registration Is Required for Support

Although OES 2 NetWare and NetWare 6.5 share the same code base and are the same in every way, virtualized NetWare in Xen is an OES 2 product feature. Support for NetWare on a Xen virtual machine is available only to OES 2 registered customers.

5.2.2 Supported Configurations and Features

The following configurations and features are supported for NetWare VM guest servers.

- ♦ OES 2 NetWare or later running in paravirtual mode.
- ♦ The graphical paravirtualized frame buffer and the text-based console interface.
- ♦ Running on 32-bit, 32-bit PAE, and 64-bit hypervisors.
- ♦ Running in 32-bit PAE compatibility mode on 64-bit platforms.
- ♦ Up to 16 block devices.
- ♦ Up to 32 virtual CPUs.
- ♦ The pause and resume functionality.
- ♦ The `xm shutdown` command.
- ♦ The `shutdown` command in Virtual Machine Manager.
- ♦ Allocated memory from 1 GB to 8 GB.
- ♦ VCPU overcommitment, pinning, and capping.
- ♦ Installations using a NetWare response file.

5.2.3 Unsupported Configurations and Features

The following configurations and features are not supported for NetWare VM guest servers.

- ♦ NetWare in full virtualization mode.
- ♦ NetWare 6.5 SP6 and earlier running on a virtual machine.

- ♦ VCPU hotplug.
- ♦ Network or block device hotplug.
- ♦ Virtual memory resizing.
- ♦ Direct access to physical devices.
- ♦ The save, restore, and migrate commands.
- ♦ Some Novell Remote Manager debugging features.

5.3 Preparing to Install a NetWare VM Guest Server

- ♦ [Section 5.3.1, “Planning for VM Host Servers,” on page 83](#)
- ♦ [Section 5.3.2, “Planning for NetWare VM Guest Servers,” on page 84](#)
- ♦ [Section 5.3.3, “You Must Use Timesync for Time Synchronization,” on page 85](#)
- ♦ [Section 5.3.4, “Disabling the Alt+Esc Shortcut on the Host,” on page 85](#)

5.3.1 Planning for VM Host Servers

- ♦ [“Meeting Server Hardware and Software Requirements” on page 83](#)
- ♦ [“Deciding Whether to Run OES Services on VM Host Servers” on page 84](#)

Meeting Server Hardware and Software Requirements

To accommodate NetWare VM guest servers, your VM host servers must:

- ☐ Meet the criteria specified in [“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.
- ☐ Have enough memory (RAM) on the physical machine for
 - ♦ The SLES 10 operating system (512 MB)
 - ♦ Any of the supported OES services that you install on the VM host (512 MB)
 - ♦ Each NetWare virtual machine that you plan to run concurrently (1 GB to 8 GB)

For example, if you are installing one NetWare VM guest server on a SLES 10 VM host server, you need a minimum of 1.5 GB of memory: 512 MB for the VM host server and 1 GB for the NetWare VM guest server. For optimal performance, you should allocate as much memory as possible for each NetWare VM guest, up to 8GB each.

- ☐ Have enough disk space on the host server for creating and running the VM guest servers.
- The default disk space for a NetWare VM guest server is 10 GB. You might need more or less space depending on what you will use the guest server for and what its storage configuration will be. You might want to locate your virtual machines on a separate partition or even on a separate storage device. For example, you might create a `/vm` partition on a separate drive installed in the server. For additional information, see [“Storage Planning” on page 84](#).

Deciding Whether to Run OES Services on VM Host Servers

You should also decide whether to install OES 2 SP1 Linux and one or more of its supported services on your VM host servers.

To ensure that optimal resources are available to the virtual machines, each VM host server should be dedicated to running the Xen virtualization software as much as possible. However, there are several good reasons why you might want to choose to install one or more of the supported OES services on the host server itself. For more information, see “[Why Install OES Services on Your VM Host?](#)” in the *OES 2 SP1: Planning and Implementation Guide*.

5.3.2 Planning for NetWare VM Guest Servers

Before creating NetWare virtual machines, you need to plan for the following:

- ♦ “[RAM Planning](#)” on page 84
- ♦ “[Storage Planning](#)” on page 84
- ♦ “[Network Planning](#)” on page 84
- ♦ “[eDirectory Planning](#)” on page 85

RAM Planning

To ensure the best performance by your NetWare VM guests, you should plan for the optimal RAM configuration of each NetWare VM guest server. As a general rule, the more RAM you assign to a NetWare guest server (up to 8 GB), the better the server performance will be. For specific planning information, see “[Optimizing Server Memory](#)” in the *OES2 SP1: Server Memory for NetWare Administration Guide*.

Storage Planning

The disk space that you allocate while creating the Xen virtual machines is used by the NetWare VM guest for the sys: volume.

For best performance in a Xen virtual environment, NSS pools and volumes on NetWare should be created on virtual devices that are SCSI devices, Fiber Channel devices, or iSCSI devices on the host server, or on partitions that are on those types of devices.

SATA or IDE disks have slower performance because special handling is required when working through the Xen driver to ensure data writes are committed to the disk in the order intended before it reports back.

For more information on NSS disk storage, see “[Using NSS in a Virtualization Environment](#)” in the *OES 2 SP1: NSS File System Administration Guide*.

Network Planning

Each Xen guest VM is assigned one virtualized network card by default. You can create additional cards if desired.

You must obtain one static IP address for each virtualized network card you plan to create on your NetWare VM guest servers. OES 2 SP1 does not support dynamically-assigned (DHCP) IP addresses.

eDirectory Planning

You can place a NetWare virtual machine in an existing tree or as the first server in a new tree. However, the performance of virtualized NetWare doesn't match a physical NetWare installation. In most cases, it is probably preferable to add your NetWare virtual machine to an existing tree located on a physical NetWare server, particularly if the tree is large.

Also, because virtualized servers might be started and stopped more often than they would normally be on physical servers, we recommend that the master replica (usually the first server in a tree) be placed on a system that is running at all times. For more information about Master Replicas, see [“Managing Partitions and Replicas”](#) in the *Novell eDirectory 8.8 Administration Guide*.

5.3.3 You Must Use Timesync for Time Synchronization

Because of known issues with Xen and the NTP NLM, you must use Timesync as the time synchronization method for NetWare VM guests running on Xen VM hosts. Otherwise, time drift causes problems for your NetWare VM guests.

Keeping accurate time is a critical function for servers in an eDirectory tree. The reported time must be synchronized across the network to provide the expiration dates and time stamps necessary for ordering eDirectory events.

NetWare VM guest servers synchronize time in the same ways that NetWare physical servers do. In other words, the clock on the VM host server has no influence on the NetWare VM guest server's time.

IMPORTANT: To ensure your NetWare VM guest is configured correctly, be sure to follow the instructions in [Section 4.13.2, “Configuring Time Synchronization,” on page 68](#) (specifically [Step 4 on page 69](#)) and configure the NetWare VM guest to get time from the same time source as the eDirectory tree it is joining. If the time source specified is an NTP server, be sure to select the NTP option next to the source's DNS name or IP address. This enables Timesync to communicate with the NTP time source.

5.3.4 Disabling the Alt+Esc Shortcut on the Host

Alt+Esc is used on a NetWare server to switch between console screens, but on SLES 10 it moves between open windows. To provide the expected behavior for the virtualized NetWare server, you must disable the shortcut for SLES 10.

- 1 On the host server as the `root` user, click *Computer > Control Center*.
- 2 Click *Personal > Shortcuts*.
- 3 Under the *Window Management* category, click *Move between windows immediately*, then press the Backspace key to disable the shortcut.
- 4 Click *Close*.
- 5 Close the Control Center.

5.4 Installing Virtualized NetWare

This section provides the instructions for installing OES 2 SP1 NetWare as a guest OS.

- ♦ [Section 5.4.1, “Preparing the Installation Media,” on page 86](#)

- ♦ [Section 5.4.2, “Creating a Response File for an Unattended NetWare Installation,” on page 86](#)
- ♦ [Section 5.4.3, “Creating a Xen Virtual Machine and Installing a NetWare VM Guest Server,” on page 88](#)

5.4.1 Preparing the Installation Media

You must use the DVD installation files to install a NetWare VM guest on a Xen VM host server. (Xen on SLES 10 doesn't support CD swapping.)

The installation media must appear as a local disk to the virtual machine, but it can be physically located in either of the following locations:

- ♦ On a DVD in the host's physical DVD reader.
- ♦ As the DVD ISO image file copied to the Xen VM host server desktop.

The following steps are for downloading to the VM host server's desktop and can be adapted as necessary for the other locations listed above.

- 1 Using the Firefox* browser on the VM host server, access the [Novell Open Enterprise Server 2 Download and Instructions page](http://www.novell.com/documentation/oes2/esd/di_oes2_sp1.html) (http://www.novell.com/documentation/oes2/esd/di_oes2_sp1.html) and download the `NW65SP8_OVL_DVD.iso` file to the server's desktop (or another arbitrary location of your choosing).
- 2 After the file downloads, if you are installing on an OES 2 SP1 VM host server by using a response file, continue with [Step 3](#). Otherwise, skip to [Section 5.4.3, “Creating a Xen Virtual Machine and Installing a NetWare VM Guest Server,” on page 88](#).
- 3 Click *Open* in the Firefox download dialog box.
- 4 Sort the list of files by *Location* by clicking the column heading, then scroll to */LICENSE*.
- 5 Select the `.NFK` and `.NLF` files, right-click them, and select *Extract*.
- 6 In the Extract dialog box, click *Extract*, then close the ISO file and the browser.
- 7 Double-click the `LICENSE` folder on the desktop or other arbitrary location that you chose in [Step 1](#), select the two files you extracted and drag them to the desktop, then delete the `LICENSE` folder by dragging it to the Trash.

Continue with the next section.

5.4.2 Creating a Response File for an Unattended NetWare Installation

OES 2 SP1 includes a YaST-based NetWare Response File Utility that asks you for information about the NetWare server you want to install. Basically, you answer the same questions as you would during a physical NetWare installation. When the time comes to run the NetWare Install program, the installation reads your responses from the file and proceeds without requiring further intervention.

- 1 Open YaST and click *Open Enterprise Server > NetWare Response File Utility*.
- 2 On the Select Install Type page, make sure the *Hardware Type* is set for *Virtual*. Do not change any other options. Click *Next*.
- 3 Click *Destination Address*, specify a valid NetWare server name for the virtualized NetWare server and the IP address you want the virtualized server to use.

The IP address must be unique on the subnet just as it would be for a physical NetWare installation.

- 4 Click *Next*.
- 5 Click *Destination eDirectory*.
- 6 Specify the name of the eDirectory tree and a context for this server object.
- 7 In the *Replica Server IP Address* field, specify the IP address of the eDirectory server.
- 8 In the *User Information* section, specify the admin information for the tree, then click *Next*.
- 9 Click *License*, specify the eDirectory container where you want the NetWare license files stored (usually the Organization object), then click *Next*.
- 10 Click *Protocols*.
- 11 Specify the *Subnet Mask* and *Gateway* information for the subnet and click *Next*.
- 12 Click *Language*, change the language settings if needed, then click *Next*.
- 13 Click *SLP Configuration*.
- 14 If your tree has more than three servers, specify the valid SLP information before continuing, then click *Next*.
- 15 Click *DNS Configuration*, specify the DNS information, then click *Next*.
- 16 Click *Time Zone Configuration*, select your time zone options, then click *Next*.
- 17 Click *Time Sync Configuration*.
- 18 Leave the protocol set to TimeSync (do not select NTPv3), select *Use TIMESYNC Configured Sources*, and specify the same time synchronization source as your eDirectory server uses, select *NTP* if applicable, then click *Next*.
- 19 Click *Install Settings*, change the default settings if needed, add any needed SET parameters by clicking *Edit*, then click *Next*.
- 20 Click *Storage Configuration*, adjust the default sizes if desired, then click *Next*.
- 21 Click *Pattern Selection*, select the preconfigured server pattern you want installed, then click *Next*.
- 22 If you selected *Customized NetWare Server* in the previous step, click *Product Selection*, select the services you want installed, and click *Next*.
- 23 Click *NMAS Configuration* > *Next* > *Next*.
- 24 (Conditional) Depending on what products you selected for the server, click the headings and enter the required information until all the configuration options have been completed for the response file.
- 25 On the Save Response File page, specify a response filename, then browse to the directory where you stored your NetWare license files. (If you completed all of the instructions in [Section 5.4.1, "Preparing the Installation Media," on page 86](#) The field should show a path that ends with a forward slash (/).
- 26 If you want the VM Manager to launch automatically after you exit the Response File Generator, select *Launch VM Manager*.

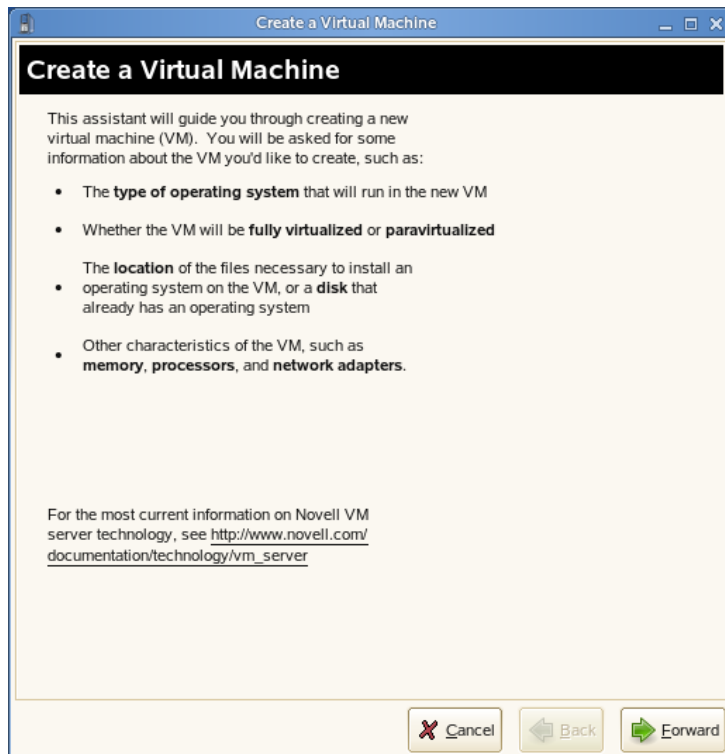
IMPORTANT: If the option is not selectable, that means the server isn't running the Xen kernel. See [Section D.2, "VM Manager Doesn't Launch on a Xen VM Host Server," on page 195](#).

- 27 Specify the location of the Installation Source by browsing to the DVD .iso file that you copied to the local server, then click *Finish*.
- 28 Click *Next*.
- 29 If you chose to automatically launch VM Manager in Step 26 above, click *Forward* and skip to Step 5 on page 90. Otherwise, continue with Section 5.4.3, “Creating a Xen Virtual Machine and Installing a NetWare VM Guest Server,” on page 88.

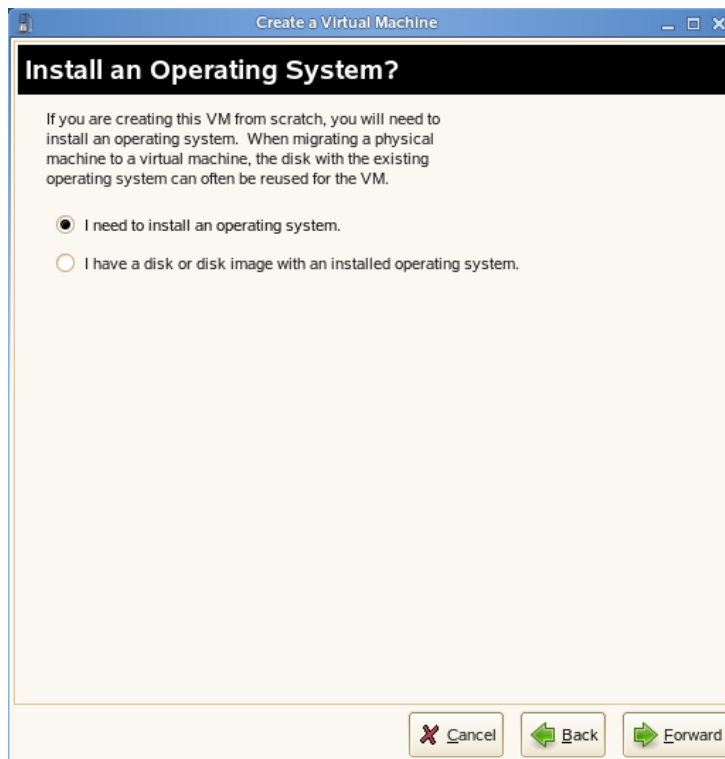
5.4.3 Creating a Xen Virtual Machine and Installing a NetWare VM Guest Server

Follow these steps to create a Xen VM and install a NetWare VM guest server.

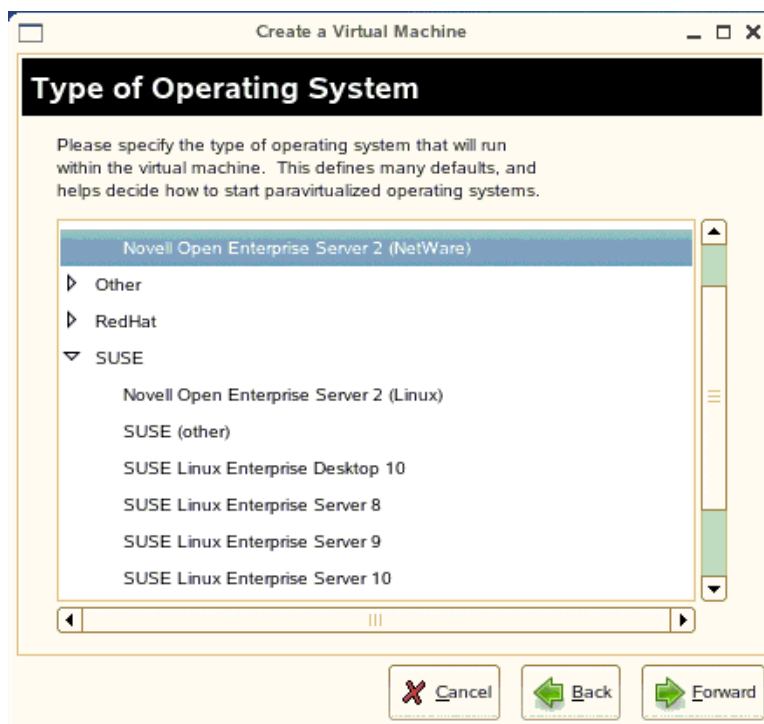
- 1 Open YaST, then click *Virtualization > Create Virtual Machines*.
- 2 Read the Create a Virtual Machine welcome page, then click *Forward*.



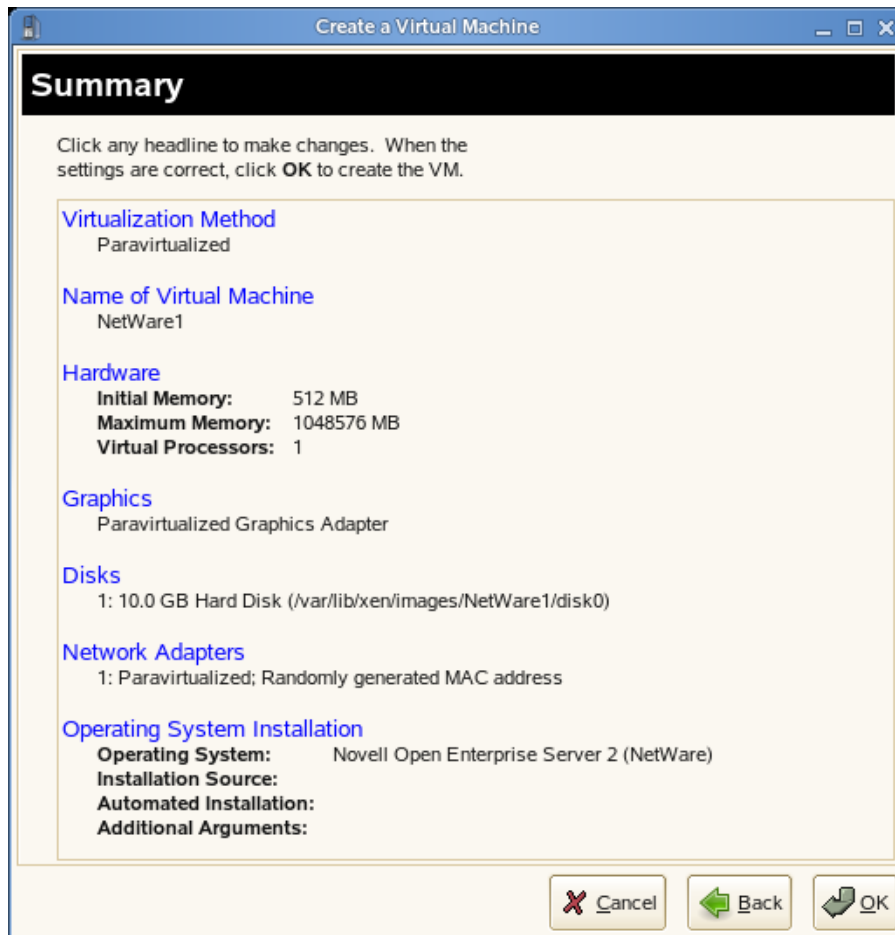
- 3 Select *I need to install an operating system*, then click *Forward*.



- 4 Click the triangle by *NetWare*, select *Novell Open Enterprise Server 2 (NetWare)*, then click *Forward*.



The Summary page appears, showing the settings to be used for the virtual machine.



5 Click *Name of Virtual Machine*.

Specify the name that you want displayed for this virtual machine in the Virtual Machine Manager.

For example, you might specify *hostname_vm*, where *hostname* is the host name of the server you are installing.

6 Click *Hardware*.

Change the initial memory setting to at least 1024 MB and the maximum setting to as much as 8GB, depending on the RAM available on your host server.

Add additional virtual processors if desired.

7 Click *Disks*.

The Virtual Disks dialog box lets you create the virtual disks that the NetWare VM guest will have access to. This includes the installation media if you are installing from a DVD on the host server or from an ISO image file copied to the host server's storage devices.

Initially, a 10 GB file is specified for the partitions/volumes on the virtual server. The default location of the file is `/var/lib/xen/images`.

By default, this is a sparse file, meaning that although 10 GB is allocated, the size of the file on the disk will only be as large as the actual data it contains. Sparse files conserve disk space, but they have a negative impact on performance.

The NetWare install allocates 500 MB for a DOS partition and 4 GB for the SYS: volume. The default disk size of 10 GB leaves about 5.5 GB for other partitions.

- 8** If you want to change the location of the NetWare VMs first virtual hard drive, select the default *Hard Disk* and click *Edit*. Then modify the path in the Server field to where you want the virtual disk located.

Make sure that you have enough physical disk space on the host server's hard drive and partition specified to accommodate the maximum size of the virtual disk.

- 9** If you want optimal performance, you should deselect the sparse file option. This creates a blank file of the selected size when you start the virtual machine installation.
- 10** Click *OK*.
- 11** If you are installing from a mounted DVD, click *CD-ROM*, browse to `/dev/cdrom` or `/dev/dvd`, then click *Open > OK > Apply*.
- 12** If you are installing from a downloaded ISO image file, browse to the image file, then click *Open > OK > Apply*.
- 13** If you want multiple virtual network adapters, click *Network Adapters*.

Create virtual network adapters for the server.

The default setting is a single paravirtualized network adapter.

- 14** (Conditional) If you are installing on an OES 2 SP1 VM host and you created a response file that you want to use for the NetWare installation, click *Operating System Installation* and complete the following tasks:

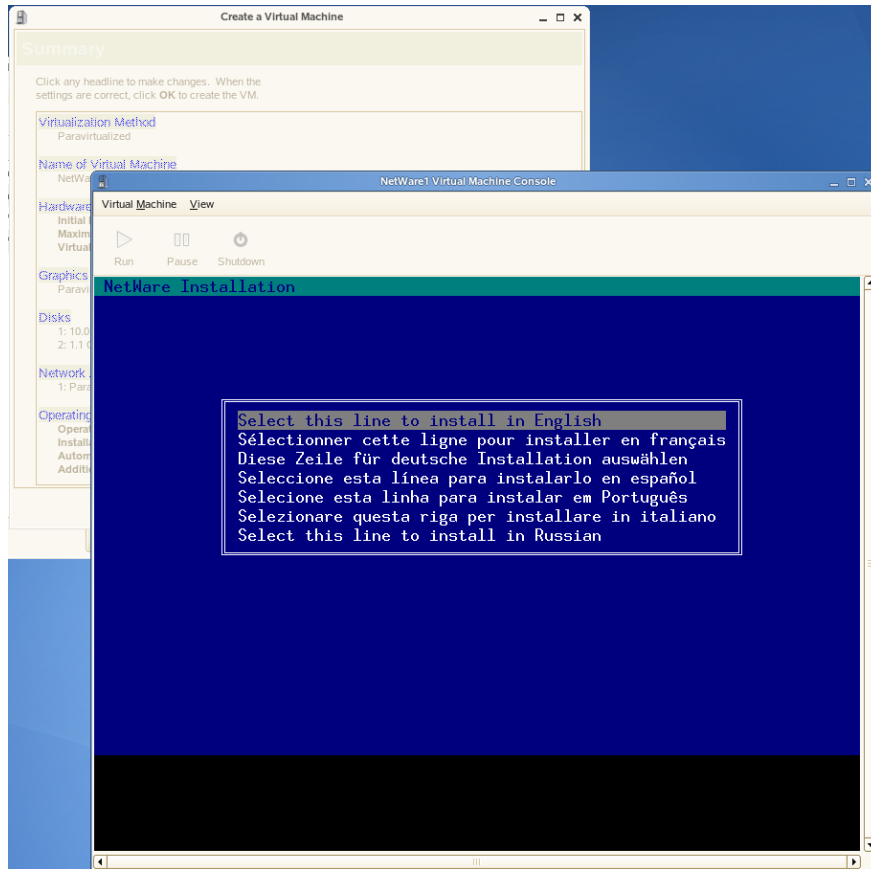
14a Click *Find*, then browse to and select the file you created in [Section 5.4.2, "Creating a Response File for an Unattended NetWare Installation,"](#) on page 86.

14b Click *Open > Apply*.

The response file's path and filename should be displayed in the Automated Installation field on the Summary page.

- 15** When you have the virtual machine settings the way you want them, click *OK* to proceed with the creation of the virtual machine and the installation of the virtual NetWare server.

A VNC viewer window appears, displaying the progress of the NetWare install program.



If you specified a response file, the installation uses the information you recorded in the response file. If a required parameter is missing in the response file, you are prompted to enter the desired values during the installation.

If you did not specify a response file, you must do the following:

15a Click inside the installation window to set the mouse pointer.

The mouse is not used on the first few screens, but you must set it now. Otherwise, the mouse and the keyboard might not work as expected when the GUI pages appear.

15b Enter all of the installation information as you would for a physical NetWare installation. For detailed instructions, see “[Section 4.2, “Starting the Installation Program,” on page 38.](#)”

IMPORTANT: Do not close the VNC viewer window while the NetWare install program is running. Doing so prevents the installation from completing properly.

5.5 Managing NetWare on a Virtual Machine

Virtualized NetWare is managed in the same way as if it were running on a physical machine. For information about managing your NetWare server, see the *OES2 SP1: Server Operating System for NetWare Administration Guide*. For additional information about managing NetWare servers in a virtualized environment, see “[Running OES 2 NetWare in a Virtualized Environment](#)” in the same guide.

5.5.1 Using the Virtual Machine Manager

Managing a NetWare virtual machine is simplified by using the Virtual Machine Manager utility, which is installed by default when you install the Xen virtualization software.

To start Virtual Machine Manager, open a terminal prompt and enter `virt-manager`.

For more information, see “*Managing a Virtualization Environment* (http://www.novell.com/documentation/sles10/xen_admin/data/cha_xen_virtualization_manage.html)” in the *Virtualization with Xen* (http://www.novell.com/documentation/sles10/xen_admin/data/bookinfo.html) guide.

5.5.2 Using the Command Line

Many NetWare administrators prefer to manage the server by command line. If you want to use the command line, you should be aware of issues related to the following:

- ♦ “Terminal Size” on page 93
- ♦ “NetWare Debugger” on page 93
- ♦ “VNC Viewer” on page 93
- ♦ “The `xm` Commands” on page 93

Terminal Size

The terminal window might display only 80x24 characters. If you don’t want to scroll to the command line, you need to resize the terminal.

NetWare Debugger

If pressing `Alt+Shift+Shift+Esc` doesn’t launch the debugger, you can enter `386debug` at the command line to launch the debugger.

VNC Viewer

In the VNC Viewer, pressing `F8` displays a pop-up utility menu. Press `F8` twice to pass single `F8` to the remote side.

The `xm` Commands

- ♦ You can also manage the NetWare virtual machine, and all other virtual machines, by using the `xm` command line tools. For more information, see “*The `xm` Command* (http://www.novell.com/documentation/sles10/xen_admin/data/sec_xen_virtualization_xm.html)” in the *Virtualization with Xen* (http://www.novell.com/documentation/sles10/xen_admin/data/bookinfo.html) guide.
- ♦ To make a break in NetWare from a terminal, enter `xm sysrq x c`, where `x` is the domain ID and `c` is any keyboard character.

Upgrading an OES 2 NetWare Guest on a Xen-based VM Host Server

- Section 6.1, “Upgrading the VM Host Server,” on page 95
- Section 6.2, “Upgrading the NetWare VM Guest Server,” on page 95

6.1 Upgrading the VM Host Server

Before you upgrade the NetWare VM guest servers on any Xen-based VM host servers, be sure to upgrade the host server to either SLES 10 SP2 or OES 2 SP1, as applicable.

For SLES 10 SP2 upgrade instructions, see the *SLES 10 SP2 Installation and Administration Guide* (http://www.novell.com/documentation/sles10/sles_admin/data/sles_admin.html).

For OES 2 SP1 upgrade instructions, see “Upgrading to OES 2 SP1 Linux” in the *OES 2 SP1: Linux Installation Guide*.

6.2 Upgrading the NetWare VM Guest Server

After you have upgraded the Xen VM host server, upgrading an OES 2 NetWare guest on the host server is the same as upgrading a physical installation. You accomplish this by installing the Support Pack 8 (SP8) (which is the same thing as OES 2 SP1 NetWare) on the server.

The only difference with upgrading a NetWare VM guest is the process of providing access to the SP8 media.

If the support pack is unzipped to a location on the Guest, such as the `sys :` volume, the process of installing the support pack is exactly the same as on a physical server.

If the support pack is unzipped on a DVD or to a location on the host server, you must add the DVD or location to the VM guest. Keep in mind that you can only specify a block device, such as a mounted DVD or the root of a separately defined partition on the VM host server. You cannot specify a directory where you’ve unzipped the support pack files as a block device for the VM guest to access.

6.2.1 Downloading the NetWare SP8 Zip File

- 1 Log into your Novell account and access the [Open Enterprise Server 2 SP1 e-Media Kit](http://download.novell.com/Download?buildid=n6SkQz52x7s~) (<http://download.novell.com/Download?buildid=n6SkQz52x7s~>).
- 2 Download the `NW65SP8.zip` file.
- 3 Extract the Support Pack files contained in the zip file you downloaded.
- 4 Complete the following step that applies to your situation.
 - 4a If you have extracted the file so a root-level directory on the VM guest, continue with the instructions in [Section C.5, “Starting an Upgrade,” on page 187](#).

- 4b** If you have extracted the file to a partition on the VM host, see the [Virtualization with Xen](http://www.novell.com/documentation/sles10/xen_admin/data/bookinfo.html) (http://www.novell.com/documentation/sles10/xen_admin/data/bookinfo.html) guide for information on making a block device available to a VM guest.

IMPORTANT: After adding the block device, you will probably need to reboot the NetWare VM guest before it will recognize it.

- 4c** If you have extracted the file to a DVD, continue with [Providing Access to a Mounted DVD](#).

6.2.2 Providing Access to a Mounted DVD

After downloading the `NW65SP8.zip` file and extracting it to a DVD, do the following:

- 1** Insert the DVD in the VM host server.
- 2** On the desktop, click *Computer > Virtual Machine Manager*.
- 3** Select the NetWare VM guest you are upgrading, then click the *Details* button.
- 4** Click the *Hardware* tab.
- 5** Click the *Add* button.
- 6** In the *Hardware Type* drop-down list, select *Storage Device*, then click *Forward*.
- 7** Under *Target* in the *Device Type* drop-down list, select *Virtual Disk (read only)*.
- 8** With the *Normal Disk Partition* option selected, click *Browse*.
- 9** In the *Places* column, double-click *File System*, then double-click the `dev` folder.
- 10** Click the `dvd` device file, then click *Open*.
- 11** Click *Forward > Finish*.

You should see a new disk in the *Hardware* list.

- 12** In the NetWare VM guest's Machine Console, open the file browser.
- 13** If the DVD is listed, write down the volume name listed, then go to [Step 2 on page 35](#) and complete the instructions there.
If the DVD is not listed, continue with [Step 14](#).
- 14** Shut down and restart the NetWare VM.
- 15** After the VM restarts, confirm that the DVD is listed, write down the volume name, and then go to [Step 2 on page 35](#).

Security Considerations

7

This section includes issues that you should consider when installing and configuring a Novell® Open Enterprise Server 2 (OES 2) NetWare® server.

- ♦ [Section 7.1, “Installing Using a Response File,” on page 97](#)
- ♦ [Section 7.2, “Access to the Server during Installation or Upgrade,” on page 97](#)
- ♦ [Section 7.3, “Remote Installations Using Remote Console,” on page 97](#)

7.1 Installing Using a Response File

When you create a response file for a NetWare installation, the eDirectory™ password for user Admin is written in clear text. This password can be read by anyone who has access to the file. NetWare passwords are stored in the file in a hashed form.

We recommend controlling access to the response files.

7.2 Access to the Server during Installation or Upgrade

Because eDirectory passwords are not obfuscated in system memory during the installation or upgrade, we recommend not leaving a server unattended during the installation, upgrade, or configuration.

Using ssh (secure shell) or the NetWare Remote Console to access the system does not work during installation. NetWare installation is always a down server installation, so unauthorized users cannot connect to the computer from other computers on the network during an installation.

7.3 Remote Installations Using Remote Console

While installing the server, we recommend that you do not use NetWare Remote Console for remote installation in an untrusted environment.

NetWare Response File Reference

A

This section contains instructions and reference information on performing a “silent” or unattended installation of Novell® Open Enterprise Server (OES) NetWare® using a response file. It addresses the following topics relating to response file creation and use:

- ♦ [Section A.1, “NetWare Response File Overview,” on page 99](#)
- ♦ [Section A.2, “Response File Usage Scenarios,” on page 102](#)
- ♦ [Section A.3, “Using the NetWare Response File Utility in YaST,” on page 105](#)
- ♦ [Section A.4, “Using the Response File Generator in the Deployment Manager,” on page 115](#)
- ♦ [Section A.5, “Response File Syntax,” on page 125](#)

A.1 NetWare Response File Overview

Installing the NetWare operating system software can be easier and more flexible when you use a response file. When used with the graphical server installation program, a response file lets you do several things:

- ♦ Set and display specific server defaults.
- ♦ Bypass sections of the installation or upgrade.
- ♦ Automate the entire server installation or upgrade process.

Using a response file to install NetWare can be useful to a variety of customers and vendors. Novell customers who have established server hardware standards in their enterprise can use the response file to rapidly deploy multiple NetWare servers. The response file is also useful for preconfiguring some of the NetWare installation, while leaving other parameters to the local administrator.

Resellers and OEMs can use response files to preinstall NetWare prior to shipping servers to their customers (a “factory” install).

A.1.1 What Is a Response File?

A response file is a text file containing sections and keys (similar to a `Windows.ini` file). Each section heading is enclosed in square brackets (`[]`) and is followed by the keys and key values for that section, with each key listed on a separate line.

If you use a response file, the NetWare server install program reads the installation parameters directly from the response file, replacing the default installation values with response file values. The installation program accepts the values as they appear in the response file and continues to the next installation screen. By placing the required installation information in a response file, you can bypass sections of the installation program or even skip the entire sequence of installation screens.

Whenever you run the NetWare installation program, the installation parameters you select are saved in a response file named `response.rsp` in the `sys:ni\data` directory. This file can then be used as a template or it can be modified for use with future server installations.

In NetWare, a custom response file needs to contain only the entries that vary from those found in the generic `response.txt` file provided on *NetWare 6.5 SPx CD 1 (Operating System)* or the *NetWare 6.5 SP8 DVD*. The response file parser merges these two files, and duplicate entries in the custom response file replace those found in the default file.

Be sure to check the log files after completing a response file installation to ensure that no errors were reported. The error log is located at `sys:\ni\data\nierrors.log`. The complete log (errors and successes) is located at `sys:\ni\data\ni.log`.

A.1.2 Creating a Response File

You can create a new response file or edit one from a previous server installation.

- ♦ “Creating a New Response File” on page 100
- ♦ “Editing a Response File from a Previous Server Installation” on page 100

Creating a New Response File

Although you can create a response file using any ASCII editor, Novell recommends using the NetWare Response File Utility in YaST or the Response File Generator in Deployment Manager to automatically create your response files. This eliminates the chance of entering the wrong text into the response file.

To create a new response file using the NetWare Response File Utility in YaST, follow the instructions in [Section A.3, “Using the NetWare Response File Utility in YaST,” on page 105](#).

To create a new response file using the Response File Generator in Deployment Manager, follow the instructions in [Section A.4, “Using the Response File Generator in the Deployment Manager,” on page 115](#).

To create a response file manually, use an ASCII editor such as EDIT and input parameters as described in [Section A.5, “Response File Syntax,” on page 125](#).

Editing a Response File from a Previous Server Installation

You can generate a response file from a server installation and then use it as input for additional server installations. Using the response file from another server installation works best when both servers have the same hardware configuration.

IMPORTANT: You should take care when using a response file from a previous installation because it can contain advanced or specialized configuration options that you don’t want for your current installation.

- 1 Perform the first server installation, then reboot the server by clicking *Yes* on the closing screen of the installation.
- 2 Log in to the new server after it has been rebooted.
- 3 Copy `response.rsp` from the `sys:\ni\data` directory to either a diskette or the new server.
- 4 Modify the file by adjusting the parameters and removing unwanted sections.
See [Section A.5.3, “Response File Sections and Keys,” on page 126](#) for a description of the parameters.

A.1.3 Specifying the Use of a Response File

You can specify which response file you want to be used during a server installation or upgrade in either of two ways:

- ♦ “Specifying a Response File at the Server Console” on page 101
- ♦ “Specifying a Response File during a Server Installation” on page 101
- ♦ “Using CD Boot with a Response File” on page 101

You can also use CD Boot instead of specifying a response file name.

Specifying a Response File at the Server Console

- 1 Copy the response file to a diskette, hard disk, or network directory accessible by the server that you are installing NetWare on.
- 2 Insert *NetWare 6.5 SPx CD 1 (Operating System)* into the server’s CD drive and boot the computer.
- 3 Press any key before the installation program begins, press P, then specify the path to the response file using this syntax:

```
[inst: /rf=DOS_path\response_file_name]
```

Replace *DOS_path* with the path to the response file and *response_file_name* with the name of the response file. For example, if the response file is named `response.txt` and it is located on a diskette, you would enter

```
[inst: /rf=a:\response.rsp]
```

- 4 Continue with the rest of the server installation.

Specifying a Response File during a Server Installation

- 1 Copy the response file to a diskette, hard disk, or network directory accessible by the PC that you are installing NetWare on.
- 2 Insert *NetWare 6.5 SPx CD 1 (Operating System)* into the CD drive and reboot the machine to start the server installation.
- 3 On the Welcome to the NetWare 6.5 Server Installation screen (the first screen after the JReport Runtime License Agreement screen), press F3 for the response file window.
- 4 Type the path for the response file, then press Enter.
- 5 Continue with the rest of the server installation.

Using CD Boot with a Response File

Some installers prefer not to specify a response file name either at the server console or during the NetWare install program. They want to simply insert *NetWare 6.5 SPx CD 1 (Operating System)*, boot the machine, and have the installation program proceed on its own.

To make this work, name your response file `response.txt` and copy it to a directory named `c:\nwupdate` on the server’s hard drive. When the machine boots with the NetWare CD, the startup utility checks for a `response.txt` file in the `c:\nwupdate` directory. If such a file exists, the installation program bypasses the DOS partitioning utility (using the default partition size) and uses `response.txt` as the input response file for the rest of the installation.

A.2 Response File Usage Scenarios

This section provides basic instructions for the following response file usage scenarios:

- ♦ [Section A.2.1, “Automating a New Server Installation,” on page 102](#)
- ♦ [Section A.2.2, “Automating a Server Upgrade,” on page 103](#)
- ♦ [Section A.2.3, “Performing a Factory Installation,” on page 104](#)

In each of these scenarios, you can save time and a CD swap by copying the NetWare installation files from *NetWare 6.5 SPx CD 1 (Operating System)* and *NetWare 6.5 SPx CD 2 (Products)* to a source location that is accessible to the install program. Depending on the scenario, this could be a remote NetWare server, a server’s local hard disk drive, or, in the case of a remote silent upgrade, the workstation that you are running Deployment Manager on.

A.2.1 Automating a New Server Installation

To fully or partially automate a new server installation with a response file:

- 1 Create or edit a response file, using either the NetWare Response File Utility in YaST or the Response File Generator in Deployment Manager.
Be sure to select *New Server* as the installation type for the response file.
Refer to [Section A.3, “Using the NetWare Response File Utility in YaST,” on page 105](#) or [Section A.4, “Using the Response File Generator in the Deployment Manager,” on page 115](#) for details.
- 2 Make sure you have prepared the new server hardware as discussed in [Section 4.3, “Preparing the Computer,” on page 39](#).
- 3 Copy the response file and license file to the location you designated when creating the response file.
- 4 Insert *NetWare 6.5 SPx CD 1 (Operating System)* into the server’s CD drive and reboot the machine.
- 5 Press any key to interrupt the preparation to install, then press P to specify additional installation parameters.
- 6 Enter `[inst: rf=response_file_path_and_name]`.
For example, `[inst: rf=c:\response\response.rsp]`.
- 7 Press I to proceed with the installation using the parameters specified in the response file.

If the response file contains all of the necessary installation parameters, the install program proceeds with little or no intervention required.

If some of the necessary parameters were left out of the response file, the install program prompts you for the missing information.

A.2.2 Automating a Server Upgrade

Although local and remote server upgrades are no longer supported in OES 2 SP1 NetWare, the ability to create a response file to automate these types of upgrades remains in the NetWare Response File Utility and in the Response File Generator for compatibility with previous versions of NetWare.

- ♦ “Automating a Local Server Upgrade” on page 103
- ♦ “Automating a Remote Server Upgrade” on page 103

Automating a Local Server Upgrade

A local upgrade is one that is performed on the server itself. To automate a local upgrade of a NetWare server with a response file:

- 1 Create or edit a response file, using the NetWare Response File Utility in YaST or the Response File Generator in Deployment Manager.

Be sure to select *Server Upgrade* or *Upgrade Server Locally* as the installation type for the response file.

Refer to [Section A.3, “Using the NetWare Response File Utility in YaST,” on page 105](#) or [Section A.4, “Using the Response File Generator in the Deployment Manager,” on page 115](#) for details.

- 2 Copy the following files additionally created by the NetWare Response File Utility or Response File Generator, along with the response file and license file, to the location you designated when creating the response file:

- ♦ `response_file_name.ncf`
- ♦ `response_file_name.ips`

- 3 Make sure you have prepared the server for the upgrade as discussed in [Section 4.3, “Preparing the Computer,” on page 39](#).
- 4 At the server console, execute the `.ncf` file to start the upgrade.
- 5 (Conditional) If the upgrade fails after the health checks have been performed, you can resume the upgrade as follows:
 - 5a Shut down the server.
 - 5b Insert *NetWare 6.5 SPx CD 1 (Operating System)* into the CD drive and reboot the machine.
 - 5c Press any key to interrupt the installation preparation, then press P to specify additional installation parameters.
 - 5d Enter `[inst: upgrade rf=response_file_path_and_name]`.
For example, `[inst: upgrade rf=c:\response\response.rsp]`.
 - 5e Press I to proceed with the upgrade.

Automating a Remote Server Upgrade

A remote upgrade is one that is performed from a workstation on the network, using either Deployment Manager or iManager.

NOTE: In OES 2 SP1 NetWare (NetWare 6.5 SP8), the remote upgrade functionality has been removed from both Deployment Manager and iManager. The procedure described below can be completed only if you have a previous version of NetWare 6.5.

To automate a remote upgrade of a NetWare server with a response file;

- 1 At a Windows 2000 or XP workstation, insert *NetWare 6.5 SPx CD 1 (Operating System)*.
- 2 Start Deployment Manager by executing `nwdeploy.exe` (or `nwdeploynobrowser.exe` for the nonbrowser version) from the root of the CD.
- 3 Under *Installation/Upgrade Options*, click *Automate an Installation*.
- 4 Read the information about automated server installations, then click the *Response File Generator* link.
- 5 After accepting the license agreements, click *Upgrade Server Remotely*.

As prompted, fill in the information for the server to be upgraded. See the online help for assistance.

At the end of this process, you designate the response file name, a temporary local path for the response file, and a location where the install program should look for the response file and license files. You can also type a customized description to identify the purpose of the response file.

Refer to [Section A.4, “Using the Response File Generator in the Deployment Manager,”](#) on [page 115](#) for details.

- 6 Make sure you have prepared the server for the upgrade as discussed in [Section 4.3, “Preparing the Computer,”](#) on [page 39](#).
- 7 At your Windows workstation, open a command prompt window.
- 8 Change to the folder where you have copied the NetWare installation files.
- 9 Start the upgrade by entering the following command:

```
nwdeploy -rf=response_file_path_and_name -cfg=ni/windows/
install.cfg
```

For example, `nwdeploy -rf=h:\install\response.rsp -cfg=ni/windows/`
`install.cfg`.

- 10 (Conditional) If the upgrade fails to reconnect after the first server reboot, run the `finishup.ncf` command at the server console.

The upgrade finishes locally.

A.2.3 Performing a Factory Installation

A factory installation can reduce the complexity and the amount of time spent on an installation. In this scenario, much of the hardware configuration and file copying is done in the factory so that you need to use only the graphical portion of the NetWare installation to complete the on-site configuration. Because the network operating system files are precopied to the server, installation time is reduced to just a few minutes.

In a factory installation, the NetWare server installation is split into two phases:

- ♦ Phase 1 performs the disk detection, disk partitioning, volume SYS sys:creation, and file copy portions of the install. This “image” phase is meant to be performed in a factory or configuration center.
- ♦ Phase 2 focuses on user configuration parameters. It includes the setting of the server name; protocol binding; creation of volumes other than SYS sys;; and configuration of time zone, eDirectory™, licensing, and other products. This “configuration” phase is meant to be performed at the server’s permanent location.

After Phase 1 is completed, the machine can be powered off. When the server is restarted, the graphical interface launches for Phase 2 of the installation.

To ensure that all required keys for an automated install are included in the response file, Novell recommends using the NetWare Response File Utility or the Response File Generator. Be sure to select Factory Installation as the installation type for the response file.

IMPORTANT: In a factory install, a response file must be used for both phases of the installation. You cannot use a response file for Phase 1 and then answer the installation prompts manually for Phase 2.

If you are manually creating a response file for a factory install, add the following section and key:

```
[Initialization]
Install State=Second
```

Name the finished response file `response.tmp` and save it in the `c:\nwinst.tmp` directory on the server’s C: drive.

A.3 Using the NetWare Response File Utility in YaST

OES 2 includes a new version of the Response File Generator that runs from the YaST Administrator Settings tool on Linux. This NetWare Response File Utility is automatically installed on every OES 2 Linux server. Because of the many improvements that have been made in this wizard, it is recommended that you use this method to create response files for OES 2 SP1 NetWare servers.

- ♦ [Section A.3.1, “Starting the NetWare Response File Utility,” on page 106](#)
- ♦ [Section A.3.2, “Selecting the Hardware Type, Installation Type, and Response File Template,” on page 106](#)
- ♦ [Section A.3.3, “Making the Response File Settings,” on page 107](#)
- ♦ [Section A.3.4, “Saving the Response File,” on page 114](#)

A.3.1 Starting the NetWare Response File Utility

- 1 If you have not already done so, install the OES 2 add-on product on a SLES 10 SP1 server. For more information, see “[Installing Open Enterprise Server 2 SP1 Linux](#)” in the *OES 2 SP1: Linux Installation Guide*.
- 2 To start the utility, click *Computer > YaST > Open Enterprise Server > NetWare Response File Utility*.

A.3.2 Selecting the Hardware Type, Installation Type, and Response File Template

- 1 Select the hardware type of the server you are creating the response file for:
 - ♦ Select *Virtual* to create a response file for use when installing virtualized OES 2 SP1 NetWare as a guest operating system on a Xen-based host server.
 - ♦ Select *Physical* to create a response file for use when installing physical OES 2 SP1 NetWare on standard server hardware.
- 2 Select the type of installation for the response file:
 - ♦ **New Server:** Select this option to create a response file for a new OES 2 SP1 NetWare server installation.
 - ♦ **Server Upgrade:** Select this option to create a response file to be used when performing an upgrade of a NetWare server. (This option is included for compatibility with previous versions of NetWare and should not be selected for an OES 2 SP1 NetWare server. In-place and remote server upgrades are no longer supported in OES 2 SP1 NetWare.)
 - ♦ **Factory Install - Image:** Select this option to create a response file to be used when performing the first phase of a factory installation of a NetWare server.
 - ♦ **Factory Install - Configure:** Select this option to create a response file to be used for the second phase of a factory installation of a NetWare server.

IMPORTANT: You must use a response file for both phases of a factory installation. You cannot use a response file for the image phase and then answer the installation prompts manually for the configuration phase.

- 3 (Optional) Select an existing response file to use as a template for the one you are creating.
 - ♦ **Use a response file template:** Select this option if you have previously created a response file that you want to use as the template for the new one.
 - ♦ **Response file template:** Browse to and select the existing response file you want to use as the template.

NOTE: Use only a response file created with the NetWare Response File Utility as a template. Do not use response files created with the Response File Generator in Deployment Manager for previous versions of NetWare.

- 4 Click *Next*.

A.3.3 Making the Response File Settings

To create a complete response file, you must click each of the headings on the Response File Generator page and specify the required information. Many of the sections have default settings that you can accept for most server installations. The color of the headings changes from red to blue after you have made the settings for each section.

NOTE: Depending on the selections you made on the previous screen and the settings you select as you go through the Response File Generator, you might not see all of the headings detailed in this section.

- ♦ “Source Address and Source eDirectory” on page 107
- ♦ “Destination Address and Destination eDirectory” on page 108
- ♦ “License” on page 109
- ♦ “Protocols” on page 109
- ♦ “Language” on page 110
- ♦ “SLP Configuration” on page 110
- ♦ “DNS Configuration” on page 111
- ♦ “Time Zone Configuration” on page 111
- ♦ “Time Synchronization Configuration” on page 111
- ♦ “Install Settings” on page 112
- ♦ “Storage Configuration” on page 113
- ♦ “Pattern Selection and Product Selection” on page 113
- ♦ “NMAS Configuration” on page 114
- ♦ “Additional Component Configurations” on page 114

Source Address and Source eDirectory

- 1 Click the *Source Information* heading on the Response File Generator page.
- 2 On the Source Properties page, select the *Location Type* of the NetWare 6.5 installation files.
 - ♦ Select *Remote NetWare Server* if you want to facilitate the automated installation or upgrade of NetWare servers by copying the NetWare installation files from the NetWare 6.5 CDs or DVD to a remote “source” server. The files can then be accessed from this source server instead of from a local CD/DVD drive or hard disk.
 - ♦ Select *Local Storage (HDD, CD-ROM)* if you want to use the NetWare installation CDs or DVD as the source or copy their contents to the local hard disk drive.

TIP: You can also use an `.iso` file as a local storage source.

- 3 (Conditional) If you selected *Remote NetWare Server* as the location type, specify the following information:
 - ♦ **Server Name:** The name of the source server containing the installation files.
 - ♦ **Server IP Address:** The IP address of the source server.
 - ♦ **Source Location Path:** The path to the folder where you copied the NetWare installation files; for example, `vol1:nw65inst`.

- 4 Click *Next*.
- 5 (Conditional) If you selected to install from a remote NetWare server in **Step 2**, click the *Source eDirectory* heading on the Response File Generator page and specify the following eDirectory information to enable the NetWare install program to authenticate to the tree and access the source installation files:
 - ♦ **Tree Name:** The name of the eDirectory tree in which the source server's Server object exists.
 - ♦ **Context for Server Object:** The full path of the source server object in the eDirectory tree. For example, if the source server object is in an Organizational Unit (OU) named Sales under the Organization (O) named Example, the context would be denoted as OU=Sales.O=Example or Sales.Example.
 - ♦ **User Name:** The Common Name (CN) of the user to use when logging in to the tree. This should be a user with the necessary rights to install a server object into the tree.
 - ♦ **User Context:** The full eDirectory context for the User object.
 - ♦ **Password/Retype Password:** Type the user's password in both of the password fields to verify accuracy.
- 6 Click *Next*.

Destination Address and Destination eDirectory

- 1 Click the *Destination Address* heading on the Response File Generator page.

The destination server is the new server for new server and factory installations, or the server to be upgraded for upgrades.
- 2 Specify the following information:
 - ♦ **Server Name:** For new servers and factory installations, specify a valid NetWare server name. The server name must be unique from all other servers in the eDirectory tree. The name can be between 2 and 47 alphanumeric characters and can contain underscores (_) and hyphens (-), but no spaces (). The first character cannot be a period (.).

IMPORTANT: The server name must be different from the name that you plan to use for the eDirectory tree.

 - ♦ **Server IP Address:** If you are creating a response file for a new server or server upgrade, type the IP address of the server in the *Server IP Address* field.
- 3 Click *Next*.
- 4 Click the *Destination eDirectory* heading on the Response File Generator page.
- 5 If the server is to be installed into a new eDirectory tree, select the *New Tree* check box. Otherwise, leave the check box deselected to install the server into an existing tree.
- 6 Specify the following information:
 - ♦ **Tree Name:** The name of the eDirectory tree where you want the server's Server object to be created
 - ♦ **Context for Server Object:** The full path of the Server object in the eDirectory tree. For example, a NetWare server might be installed in an Organizational Unit (OU) named Sales under the Organization (O) named Org. The context would be denoted as OU=Sales.O=Org or Sales.Org.

- ♦ **Replica Server IP Address:** The IP address of a server holding an eDirectory replica (for existing tree installations only).
- ♦ **Admin Name:** The Common Name (CN) of the Admin user with rights to install servers in the tree.
- ♦ **Admin Context:** The full eDirectory context for the Admin user object.
- ♦ **Password/Retype Password:** Type the user's password in both of the password fields to verify accuracy.

7 Click *Next*.

License

1 Click the *License* heading on the Response File Generator page.

NetWare servers must have a valid license in order to function. During the NetWare installation, the NICI keys (*.nfi files) are read and used to create a license object in the eDirectory tree.

2 Specify the following information for your server:

- ♦ **NDS License Context:** Specify the container in eDirectory where you want the NetWare license object to be created. Normally this is created at the Organization (O) level so that the license information can flow down to the entire tree.
- ♦ **Install without Licenses:** Although the server can be installed without a license, an unlicensed server allows only two user connections and is not fully functional. If you select this option, you can use the Novell iManager utility to install the necessary licenses after the installation. See [Section 4.25.2, "Installing NetWare Licenses," on page 77](#) for instructions.

If no valid license file can be found when the response file installation is run, the install assumes licenses will be installed later and continues with the installation.

3 Click *Next*.

Protocols

1 Click the *Protocols* heading on the Response File Generator page.

OES 2 SP1 NetWare provides support for the Internet Protocol (IP) and the Internetwork Packet Exchange (IPX™) protocol. Both protocols can be assigned to a single network board, which allows the server to communicate using both IP and IPX.

The IP protocol is selected by default and cannot be deselected. The IPX protocol is optional.

2 Specify the IP protocol information for the server:

- ♦ **IP Address:** Specify the IP address for the server. (In most cases, the IP address is automatically entered in this field based on the address you specified for the destination server.)

An IP address identifies each device on the network. The address consists of 32 bits, which are represented as decimal values separated by periods, such as 123.45.67.89. If your server connects to the Internet, you must obtain a unique IP address. For information on receiving an IP address, contact your Internet service provider (ISP).

- ♦ **Subnet Mask:** Specify the subnet mask (typically 255.255.255.0).

A subnet mask lets you break up your network into smaller networks. Your network might have too many nodes or be too geographically diverse to manage as a single network. Dividing your network into smaller networks lets the network routers filter and reduce the network activity seen by any of the nodes. However, dividing your network and using several network addresses might not be appropriate on a large network that needs to appear to network administrators as a single network.

- ♦ **Router (Gateway):** Specify the address of the router that connects two different environments, such as a LAN and the Internet.

You can specify a specific router (gateway) address, or you can rely on the network to automatically find the nearest router. If you specify the address, remember that the router must exist on the network segment.

- 3 (Optional) To enable IPX support on the server, select the *IPX* check box and specify the following information:

- ♦ **IPX Frame Types:** The basic installation selects the default IPX frame type for your network. You can add support for additional frame types by clicking the radio button for the desired frame types.

Each frame type that is used on the network is treated as a logical network segment and requires its own IPX network address, even though each frame type is using the same network board and physical cable segment.

- ♦ **Server ID:** Specify a hexadecimal number, one to eight digits (1 to FFFFFFFE), that identifies the server in IPX communications.

- 4 Click *Next*.

Language

- 1 Click the *Language* heading on the Response File Generator page.

The NetWare installation program supports multiple languages. If the server you are creating the response file for requires support for a language other than United States English, you can select the language and code page settings here.

- 2 For each setting, click the down-arrow to select the desired setting from a drop-down list:

- ♦ **Language:** Select English, German, Italian, Spanish, French, Portuguese, or Russian.
- ♦ **Country Code:** Select the code for the country where the server will be installed.
- ♦ **Code Page:** Select 437 for United States English or 850 for Multilingual.
- ♦ **Keyboard Code:** Select the language of the keyboard to be used with the server.

- 3 Click *Next*.

SLP Configuration

Server Location Protocol (SLP) enables client applications to dynamically discover services in TCP/IP networks. Without SLP, network resources must be manually configured or specified in a separate configuration file. Networks with no more than three servers do not need SLP.

- 1 Click the *SLP Configuration* heading on the Response File Generator page.

- 2 Specify the SLP settings for the server:

- ♦ **Do Not Install SLP:** Select this option if you do not want to install SLP.

- ♦ **DA Server IP Address:** Specify the IP addresses of the Directory Agents (DAs) on your network. You can specify up to three IP addresses for Directory Agents.
- ♦ **SLP Scope List:** Specify the scopes a DA must support. Use commas to separate each scope. For example, `net.slp.useScopes = myScope1, myScope2, myScope3`.
- ♦ **Configure Server as Directory Agent (DA):** If you do not have any DAs configured on your network or you want to add another one, you can configure this server to be a DA by selecting this option.
- ♦ **Enable Multicast Routing on This Server:** Select this option if you need multicast routing.

3 Click *Next*.

DNS Configuration

- 1 Click *DNS Configuration* on the Response File Generator page.
- 2 Specify the Domain Name Service (DNS) configuration information for your server:
 - ♦ **Host Name:** This is the simple, readable name that matches this NetWare 6.5 server's name (or the name you have bound to the network board, such as "server1").
 - ♦ **Domain:** The hierarchical name that represents the DNS naming scheme of your network, such as `example.com`.
 - ♦ **Name Server IP Address:** Specify the IP address of up to three existing DNS servers that maintain the list containing this server's simple, readable name and IP address.
 - ♦ **Verify the DNS Information:** Select this option if you want the NetWare Install program to verify the DNS information for you.

3 Click *Next*.

Time Zone Configuration

- 1 Click *Time Zone Configuration* on the Response File Generator page.
- 2 In the *Time Zone* field, select the time zone the server will reside in from the list provided.
Each time zone region displays the standard time offset from GMT, which is the difference, in number of hours, between Greenwich Mean Time (GMT) and the time zone being selected. GMT is equivalent to Coordinated Universal Time (UTC).
- 3 Select *Allow System to Adjust for Daylight Saving Time* if you want the server to automatically adjust its clock for Daylight Saving Time.
- 4 Click *Next*.

Time Synchronization Configuration

Time synchronization is a critical function for servers in an eDirectory tree. The reported time must be synchronized across the network in order to provide expiration dates and time stamps to establish the order of events taking place in eDirectory.

- 1 Click the *Time Sync Configuration* heading on the Response File Generator page.

2 Specify the time server protocol the server should use:

- ♦ **NTPv3:** Select this option to use Network Time Protocol for synchronizing time on your network. (The `xntpd.nlm` that provides NTP time packets is also capable of providing Timesync packets for servers that require them, such as NetWare 5.0 and 4.2 servers.)
- ♦ **TimeSync:** Select this option to use the legacy time synchronization mechanism built in to NetWare. (The `timesync.nlm` that provides Timesync packets is also capable of providing NTP packets for interoperability with other time servers.)

3 Specify the type of time server you want the server to be.

The NetWare time synchronization scheme distinguishes four types of time servers. Three of these provide network time: Single Reference, Reference, and Primary. All other servers are called Secondary time servers because they receive their time from the time providers.

- ♦ **Single:** The first server in a network is automatically designated as a Single Reference time server. It provides time to the entire network.
- ♦ **Reference:** A network usually has only one Reference time server. It provides a network time for all Primary time servers to migrate to. It is used on larger networks where Primary time servers are required. If more than one Reference time server exists, each must be synchronized to the same external time source, such as an atomic clock.
- ♦ **Primary:** A Primary time server is responsible for determining and setting the network time. It polls other primary and reference servers to determine the “average network time.” The average network time is then distributed to other requesting servers.
- ♦ **Secondary:** By default, all servers except the first server are designated as Secondary time servers. Secondary time servers rely on other sources such as a Single Reference time server to provide them with the network time. A Secondary time server can get the network time from another Secondary time server or from a Single Reference, Reference, or Primary time server.

NOTE: If the network has fewer than 30 servers, use the default installation settings of a Single Reference time server (the first server installed in the tree) and Secondary time servers (all subsequent servers installed in the tree). If the network has more than 30 servers, you might need to customize the environment by using different types of time servers.

4 (Optional) If you selected TimeSync as the time server protocol, you can configure up to three Timesync time sources by selecting *Use TIMESYNC Configured Sources* and specifying the IP addresses of the time sources in the Time Source fields.

If a configured time source uses NTP, select the *NTP* check box to the right of the time source.

5 Click *Next*.

Install Settings

1 Click the *Install Settings* heading on the Response File Generator page.

2 Specify the settings for various aspects of the server installation:

- ♦ **Automatic Install Reboot:** Select whether you want the server to automatically reboot after the install is complete. The default is Yes.

NOTE: Be sure to remove all floppy disks and bootable CDs from the destination server before the reboot.

- ♦ **Unsupported Drivers:** Select whether you want the NetWare install program to use untested LAN and disk drivers if no certified drivers can be found. The default is No.
 - ♦ **Driver Install Type:** Select whether you want the NetWare install to auto-load the drivers (Default) or to stop at the driver selection screens (Manual).
 - ♦ **Server Up On Reboot:** Select whether you want the server to come up after the system is rebooted. The default is Yes.
- 3** (Optional) If you want to specify non-default server SET parameters during the installation, click *Edit > Add*. Type the new SET parameter, then click *Add*.
- If you need to remove a SET parameter from the list, select it and click *Delete*.
- After you have finished adding SET parameters, click *Next*.
- 4** Click *Next*.

Storage Configuration

- 1** Click the *Storage Configuration* heading on the Response File Generator page.
- 2** In the *Fat Partition Size* field, specify the size for the server's FAT (DOS) boot partition, in megabytes.
- The default of 500 MB is sufficient for most NetWare servers.
- 3** In the *Sys Volume Size* field, specify the size for the server's sys: volume.
- The default setting is 9500 MB (approximately 9.5 GB) for the NetWare system and product files, but you can specify a larger size if you plan to store additional data on the sys: volume.
-
- IMPORTANT:** In NetWare 6.5 SP6 and earlier, the default size for the sys: volume was 4 GB (4000 MB). Starting in NetWare 6.5 SP8, that default size is no longer large enough to accommodate server installations that include iManager, Apache, and Tomcat. If you are installing a server without iManager, Apache, and Tomcat, you can decrease the size of the sys: volume if disk space is limited.
-
- 4** Click *Next*.

Pattern Selection and Product Selection

- 1** Click the *Pattern Selection* heading on the Response File Generator page.
- This page lists the patterns available for installation with OES 2 SP1 NetWare. A pattern defines a special-purpose server that can be configured during the NetWare installation.
- 2** Select the pattern you want for the server being installed.
- Selecting the button next to the name of the pattern displays a description of that pattern in the description window.
- 3** Click *Next*.
- 4** (Conditional) If you chose the Customized NetWare Server pattern, click the *Product Selection* heading to see a list of the components available for installation with OES 2 SP1 NetWare.
- 5** Select the products you want to install on the server.
- To view a description of a component, click the component's name. A description is displayed in the description box.
- Selecting a box adds the component to the list of products and services to install. Deselecting a box removes the component from the list of products and services to be installed.

To select all available components to install, select *Set All*. To deselect all components, select *Clear All*.

6 Click *Next*.

NMAS Configuration

- 1 Click the *NMAS Configuration* heading on the Response File Generator page.
- 2 Select the Novell Modular Authentication Service (NMAS™) login methods to install on the server. The defaults are Challenge Response and NDS.

To view a description of a method, click the method's name. A description is displayed in the description box.

To select all available methods to install, select *Set All*. To deselect all methods, select *Clear All*.

3 Click *Next*.

Additional Component Configurations

Depending on the components you selected for a Customized Server, the Response File Generator page can include some or all of these additional headings:

- ♦ DNS/DHCP Configuration
- ♦ iFolder Server Configuration
- ♦ MySQL Configuration
- ♦ exteNd Application Server Configuration
- ♦ NetStorage Configuration

Refer to the online help to configure the settings for these components.

A.3.4 Saving the Response File

- 1 When you have finished making all the settings for the response file (all headings are displayed as blue instead of red), click *Next*.
- 2 Specify the following information to save the response file.
 - ♦ **Response file name:** Specify a name for this response file. The default name is `netware.rsp`.
 - ♦ **Save Directory:** Browse to or specify the location on the local file system where you want to save the response file. Be sure to specify a valid path ending with a forward slash (/) character.

The NetWare license files should be saved in this same location.

NOTE: You can extract the NetWare license files from the `.iso` image file by using the Nautilus file browser. Open the image file and wait for the browser to scan the image. When the Archive Manager window appears, select the `.nfsk` and `.nlf` files in the `/license` directory and click the *Extract* icon. Select the destination folder and click the *Extract* button. The license files are saved to the specified location in a `/license` directory. If necessary, copy them to the directory where you saved the response file.

- 3 (Optional - Virtual Hardware Type only) Select *Start the VM Creation Wizard* if you want YaST to automatically launch the VM Creation Wizard and begin the process of creating a virtual machine and installing the virtualized NetWare server using this response file.

Also specify the following:

- ♦ **Custom VM name:** The default name for the virtual machine you are creating a response file for is the server name. If you want, you can change it to a custom name that is more descriptive.
- ♦ **Installation Source Location:** Browse to and select the location of the installation source (DVD, .iso image, or NFS mount).
- ♦ **Installation Destination Location:** (Factory Installations only) Browse to or specify the path to the server image that you previously created and now want to configure. The default location is `/var/lib/xen/images/vmname`.

- 4 Click *Finish* to exit the NetWare Response File Utility.

If you selected the option to start the VM Creation Wizard, the wizard automatically launches and uses the settings in the response file to install the virtual NetWare server. In most cases, no further input is required from the installer.

A.4 Using the Response File Generator in the Deployment Manager

The Response File Generator utility is launched from the Novell Deployment Manager and guides you through configuration questions that appear during a normal NetWare installation or upgrade. The input you provide for those configuration questions is used to generate a response file that can be used to automate your NetWare server installations and upgrades.

IMPORTANT: The Response File Generator is designed for installing selectable products with their default parameter values only. Custom values must be entered into the response file manually, using information found in [Section A.5.3, “Response File Sections and Keys,” on page 126](#).

- ♦ [Section A.4.1, “Launching the Response File Generator,” on page 115](#)
- ♦ [Section A.4.2, “Creating a Response File with the Response File Generator,” on page 116](#)

A.4.1 Launching the Response File Generator

- 1 On a Windows 2000 or Windows XP Professional Edition workstation that has the latest Novell Client™ installed on it, log in to your existing network as a user with the Supervisor right.
If you are prompted to log in again while running Novell Deployment Manager, you can specify the IP address of the server by clicking *Details*.
- 2 Insert *NetWare 6.5 SPx CD 1 (Operating System)* into the CD drive and run the Deployment Manager (`nwdeploy.exe` or `nwdeploynobrowser.exe` for the nonbrowser version) located at the root of the CD.
- 3 In the left frame of the browser window, under the heading *Install/Upgrade Options*, click the *Automate an Installation* link.
- 4 Read the instructions on automating the NetWare installation using a response file.
- 5 To launch the Response File Generator utility, click the *Response File Generator* link.

A.4.2 Creating a Response File with the Response File Generator

The Response File Generator takes you through a series of screens to gather the information it needs to create a response file. Some of these screens are unique to the Response File Generator; others are similar to screens you see in the NetWare installation program.

- ♦ “Accepting the License Agreements” on page 116
- ♦ “Selecting the Response File Type” on page 116
- ♦ “Selecting a Template Response File” on page 117
- ♦ “Entering the Source Server Information” on page 117
- ♦ “Entering the Destination Server Information” on page 118
- ♦ “Configuring the Networking Protocols” on page 118
- ♦ “Selecting the Language and Regional Settings” on page 119
- ♦ “Specifying License Location” on page 119
- ♦ “Setting Miscellaneous Options for Server Upgrades” on page 120
- ♦ “Specifying SLP Parameters” on page 120
- ♦ “Setting Up Domain Name Service” on page 121
- ♦ “Setting the Server Time Zone” on page 121
- ♦ “Configuring Time Synchronization” on page 122
- ♦ “Setting Miscellaneous Installation Options” on page 122
- ♦ “Choosing a Server Pattern” on page 122
- ♦ “Selecting Components to Upgrade” on page 124
- ♦ “Saving the Response File” on page 124

Accepting the License Agreements

You are first prompted to accept two license agreements: one for Novell software and one for the JReport* Runtime software used by the Response File Generator. Accepting both license agreements means that you have read and agreed to the terms and conditions contained in the license agreements.

- 1 Select *I Accept* to accept the Novell Software license agreement.
- 2 Select *I Accept* to accept the JReport Runtime license agreement.

Selecting the Response File Type

You have the option to create a response file for a new server, a factory install, a local server upgrade, or a remote server upgrade.

- 1 Click the radio button next to the selection you want:
 - ♦ **New Server:** Select this option to create a response file for a new NetWare server installation.
 - ♦ **Upgrade Server Locally:** Select this option to create a response file to be used when performing a local upgrade of a NetWare server.

- ♦ **Upgrade Server Remotely:** Select this option to create a response file to be used when upgrading a server from a workstation on the network, using either Novell Deployment Manager or Novell iManager.
- ♦ **Factory Install/Blade Image:** Select this option to create a response file to be used when performing a factory installation of a NetWare server.

2 Click *Next*.

Selecting a Template Response File

If you have a template response file, you can use it as a starting point in the creation of your customized response file. The settings found in the template response file are used to automatically fill in the input fields as you go through the Response File Generator. You can change these settings as required for your purposes.

- 1 If you want to use a template response file, select *Use a Response File Template*. Otherwise, proceed to the next screen.
- 2 Specify the path and name for the template response file, or use the browse button to select the template file.

The description for the template response file is displayed to help you confirm that you have selected the correct file.

3 Click *Next*.

Entering the Source Server Information

To facilitate the automated installation or upgrade of NetWare servers, you can copy the NetWare installation files from *NetWare 6.5 SPx CD 1 (Operating System)* and *NetWare 6.5 SPx CD 2 (Products)* to a “source” server. The install program can then access the files from this source server instead of from a local CD drive or hard disk.

- 1 If you have copied the installation files to a NetWare source server, select *Remote NetWare Server* for new server and factory installations, or *NetWare Server* for local upgrades.

If you want to access the installation files locally, select *Local Storage (HDD, CD-ROM)* for new server and factory installations, or *Workstation* for remote upgrades. Proceed to the next screen.

- 2 In the *Server Name* field, type the name of the source server containing the installation files.
- 3 In the *Server IP Address* fields, type the IP address of the source server.
- 4 In the *Source Location Path* field, type the path to the folder where you copied the NetWare installation files.
- 5 Click *Next*.
- 6 In the next screen, specify the following eDirectory information for the source server:

- ♦ **Tree Name:** The name of the eDirectory tree in which the source server’s Server object exists.
- ♦ **Context for Server Object:** The full path of the source server object in the eDirectory tree. For example, if the source server object is in an Organizational Unit (OU) named Sales under the Organization (O) named Novell, the context would be denoted as OU=Sales.O=Novell or Sales.Novell.
- ♦ **User Name:** The Common Name (CN) of the user to use when logging in to the tree.

- ♦ **User Context:** The full eDirectory context for the user object.
 - ♦ **Password:** Type and retype the user's password to verify accuracy.
- 7 When the warning about passwords being saved in the response file in clear text displays, click *OK*.

Entering the Destination Server Information

The destination server is the new server for new server and factory installations, or the server to be upgraded for remote upgrades. If you are creating a response file for a local server upgrade, skip to the next section.

- 1 In the Server Name field, specify the name for the new server or the server to be upgraded remotely.

The NetWare server name must be unique from all other servers in the eDirectory tree. The name can be between 2 and 47 alphanumeric characters and can contain underscores (_) and hyphens (-), but no spaces. The first character cannot be a period (.).

IMPORTANT: The server name must be different from the name that you plan to use for the eDirectory tree.

- 2 If you are creating a response file for a remote server upgrade, type the IP address of the server to be upgraded in the *Server IP Address* fields.
- 3 Click *Next*.
- 4 In the next screen, specify the following eDirectory information for the destination server:

NOTE: If the new server is to be installed into a new eDirectory tree, select *New Tree*. Leave *New Tree* deselected to install the server into an existing eDirectory tree.

- ♦ **Tree Name:** The name of a new or existing eDirectory tree in which you want the server's Server object to be created.
 - ♦ **Context for Server Object:** The full path of the Server object in the eDirectory tree. For example, a NetWare server might be installed into an OU named Sales under the O named Novell. The context would be denoted as OU=Sales.O=Novell or Sales.Novell.
 - ♦ **Admin Name:** The Common Name (CN) of an Admin user with rights to install servers in the tree.
 - ♦ **Admin Context:** The full eDirectory context for the Admin user object.
 - ♦ **Password:** Type and retype the Admin password to verify accuracy.
- 5 When the warning about passwords being saved in the response file in clear text displays, click *OK*.

If you are creating a response file for a server upgrade, skip to [“Specifying License Location” on page 119](#).

Configuring the Networking Protocols

NetWare provides support for IP (Internet Protocol) network packets and traditional IPX (Internetwork Packet Exchange™) packets. Both protocols can be assigned to a single network board, which allows the server to communicate using both IP and IPX.

IP is selected by default. To configure the networking protocols for your destination server:

- 1 In the *IP Address* fields, type the server's IP address.
The IP address identifies the server on the network. The address consists of 32 bits, which are represented as decimal values separated by periods, such as 123.45.67.89. If your server will connect to the Internet, you must specify a unique IP address.
- 2 In the *Subnet Mask* fields, type the subnet mask for your subnet.
- 3 In the *Router (Gateway)* fields, type the IP address of the nearest router or gateway for the destination server to use.
- 4 (Optional) To enable support for IPX, select the IPX check box.
- 5 Select the frame types you want the server to support (Ethernet_802.2, Ethernet_802.3, Ethernet_SNAP, or Ethernet_II) by clicking the corresponding radio buttons.
- 6 Type the server ID in the field provided. This is an 8-digit hexadecimal number used to identify the server in IPX communications.
You can add IPX after the server installation by adding the `SERVERID 8_digit_number` command after the `SERVERNAME` command in `autoexec.ncf`. If you choose to install IP but not IPX, the `SERVERID` reference is not used and is removed from `autoexec.ncf`.
- 7 Click *Next*.

Selecting the Language and Regional Settings

NetWare servers can display information in several languages. The language selection screen lets you select the language, country code, code page, and keyboard code you want the server to use.

- 1 Select a language from the drop-down list provided.
English is the default.
- 2 Select a country code from the drop-down list provided.
001 (USA) is the default.
- 3 Select the code page you want from the drop-down list provided.
437 (United States English) is the default.
- 4 Select the keyboard code you want from the drop-down list provided.
United States is the default.
- 5 After making your selections, click *Next*.

Specifying License Location

NetWare servers must have a valid license in order to function. The server license (`*.nlf`) file is located on the NetWare 6.5 CDs in the `/LICENSE` folder. If you have an older version of NetWare 6.5, the license is located on the *NetWare 6.5 License/Cryptography* diskette.

When creating a response file, you must indicate the location of the license file to use for the server to be installed or upgraded. This is done in the Licenses screen. Later, when you save the response file, you will indicate where the NetWare install program should look for the license file.

- 1 In the License Location field, specify the path to the license file or click the browse icon to locate the folder containing your license (`.nlf`) files.

In most cases, you would specify a location on the server's local hard drive where you have copied the license files from the installation CDs. If you have a *NetWare 6.5 License/Cryptography* diskette, the License Location would be A:\.

- 2 Select *Verify License Path* if you want the Response File Generator to verify that a specific `.nlf` file exists in the location you specified in Step 1. Otherwise, just specify the path and it will use the first `.nlf` file found in that path.

IMPORTANT: If no valid license file can be found when the response file installation is run, the install fails.

- 3 (Optional) To have the response file install or upgrade NetWare without licenses, select *Install Without Licenses*.

Although a server can be installed without a license, the unlicensed server will allow only two user connections. After installation, you can use the Novell iManager utility to install additional licenses. See [Section 4.25.2, "Installing NetWare Licenses," on page 77](#) for instructions.

- 4 Click *Next*.

Setting Miscellaneous Options for Server Upgrades

This section applies only if you are creating a response file for a local or remote server upgrade.

- 1 Specify whether you want to back up the server boot directory files by selecting the appropriate option. *Yes* is the default.
- 2 If you answer *Yes*, type the location where you want the existing files in `c:\nwserver` to be backed up prior to beginning the upgrade. The default location is `c:\nwserver.old`.
- 3 Specify whether you want the server to automatically reboot after the upgrade is complete by selecting the appropriate option. The default is *Yes*.
- 4 Specify whether you want the NetWare install program to use untested LAN and disk drivers if no certified drivers can be found by selecting the appropriate option. *No* is the default.
- 5 Select a *Default* or *Manual* upgrade by selecting the appropriate option.

The Default (formerly called Express) upgrade automatically detects the server hardware and selects appropriate drivers. It also uses the default NetWare server installation settings.

The Manual (formerly called Custom) upgrade lets you modify detected drivers and configure server settings.
- 6 Click *Next*.

Specifying SLP Parameters

NOTE: This procedure is optional.

Service Location Protocol (SLP) is an IETF standard for enabling network-based applications to automatically discover the location, including the address or domain name and other configuration information, of a required service. Using SLP, clients can connect with and make use of services on an IP network. Without SLP, network resources must be manually configured or entered into a separate configuration file.

If you choose to use SLP, it should be configured properly if the server is going to be a part of a migration that uses the NetWare Migration Wizard utility.

- 1 Specify the IP addresses of the Directory Agents (DAs) on your network in the fields provided.
If no Directory Agents exist on your network, select *Configure This Server As a DA*.
- 2 Type the SLP scope list in the field provided.
- 3 (Optional) To configure this server to be a DA, select *Configure This Server as a DA (Directory Agent)*.
- 4 (Optional) To enable multicasting, select *Enable Multicast Routing on This Server*.
- 5 Click *Next*.

Setting Up Domain Name Service

NOTE: This procedure is optional. If this server is not available to the Internet, you can skip this screen and ignore any associated error messages.

The IP protocol identifies computers and systems by their assigned IP addresses, such as 123.45.56.89. Domain Name Service (DNS) allows a specific server on the network to maintain a list of simple, readable names that match IP addresses. Applications (or protocols) that require IP addresses rather than names can use a DNS server to translate from one form to another.

- 1 Provide the following information on the Domain Name Service page:
 - ♦ **Host Name:** The simple, readable name on the DNS server that matches this NetWare server's name (or the name that you have bound to the network board).
You can set up the host computer name on the DNS server to use the NetWare server name.
 - ♦ **Domain:** The hierarchical name that represents the organization of your network, such as novell.com.
 - ♦ **Name Servers:** The IP address of the DNS server that maintains the list containing this NetWare server's simple, readable name and IP address. For more information, contact your network administrator or Internet Service Provider.
- 2 (Optional) To have the install verify the domain name service information for you, select *Verify the DNS Information*.
- 3 Click *Next*.

Setting the Server Time Zone

The server time and time zone are important in order to synchronize network events.

- 1 On the Time Zone page, select the correct time zone setting from the available list.
- 2 Select *Daylight Saving Time* if you want the system to adjust the server's clock automatically for this.
- 3 Click *Next*.

Configuring Time Synchronization

Specifying the type of time server allows the synchronization of the reported time across the network. It also provides expiration dates and time stamps to establish the order of events taking place in eDirectory. NetWare distinguishes three types of time servers that provide network time: Single Reference, Reference, and Primary. All other servers are called Secondary time servers because they receive their time from the time providers.

1 On the Time Synchronization page, select the time server type that you want.

2 (Conditional) If you do not want to accept the defaults, do the following:

2a Select *Use Timesync Configured Sources*.

2b Type the time sources in the fields provided (up to three).

Timesync time sources can be specified in any of three different formats:

- ♦ IP address
- ♦ DNS name
- ♦ Server name (IPX required)

2c (Conditional) If your time source uses Network Time Protocol (NTP), select the *NTP* option to the right of the time source.

3 Click *Next*.

Setting Miscellaneous Installation Options

This section applies only if you are creating a response file for a new server or factory installation.

1 Specify whether you want the server to automatically reboot after the install is complete. The default is *Yes*.

2 Specify whether you want the NetWare install program to use untested LAN and disk drivers if no certified drivers can be found. *No* is the default.

3 Click *Next*.

Choosing a Server Pattern

This section applies only if you are creating a response file for a new server or factory installation. If you are creating a response file for a server upgrade, skip to [“Selecting Components to Upgrade” on page 124](#).

On the Choose a Pattern page, you are given the opportunity to select a pattern for the server you want to install. Selecting a special-purpose server (pattern) displays a description of that server pattern in the Description window.

Table A-1 lists the server patterns available in OES NetWare. The exact patterns that are available vary depending on the NetWare 6.5 Support Pack level.

Table A-1 *Server Patterns in OES NetWare*

Server Pattern	Description
Customized NetWare Server	Lets you select the optional products you want to be installed on the server.
Basic NetWare File Server	Installs only basic NetWare with the minimum required additional products.
Pre-Migration Server	Creates a server that data will be migrated to at a later time by using the Netware Migration Wizard.
DNS/DHCP Server	Sets up the Novell eDirectory tree for directory-enabled DNS/DHCP services.
exteNd™ J2EE* Web Application Server	Installs an optimized configuration of the Novell exteNd Application Server.
LDAP Server	Installs Lightweight Directory Access Protocol (LDAP) Services for Novell eDirectory.
NetWare AMP (Apache, MySQL, PHP, and Perl) Server	Lets you host open source Web database applications on a NetWare server.
NetWare Backup Server	Installs the infrastructure for backup and restore services on the NetWare platform.
QuickFinder Server	Installs the products necessary for a QuickFinder™ Web search server.
Network Attached Storage (NAS) Server	Installs multiple-file protocol storage for your network.
Novell iPrint Server	Installs the Novell recommended print solution
Apache/Tomcat Server	Installs Apache Web Server and the Jakarta-Tomcat Servlet Container for use in hosting dynamic, application-driven Web sites.
Novell Nsure™ Audit Starter Pack Server	Installs the centralized auditing service that is built into NetWare.
iSCSI SAN Storage Server	Turns your NetWare server into an iSCSI Storage Server (also known as an iSCSI Target).
Management Server	Installs Novell iManager and Novell ConsoleOne® network administration software to provide a complete management solution for your server environment.
Novell iFolder Storage Server	Installs a dedicated iFolder® server.
Virtual Office Server	Installs Virtual Office, which provides a collaboration solution that addresses the need for users to be self sufficient with their IT needs.

1 Select the server pattern you want.

2 Click *Next*.

Skip to [“Saving the Response File” on page 124](#).

Selecting Components to Upgrade

This section applies only if you are creating a response file for a server upgrade.

The Response File Generator lists the components available to be installed during the server upgrade. For OES NetWare, these include the following:

- ♦ Apache2 Web Server and Tomcat 4 Servlet Container
- ♦ iPrint
- ♦ NetWare FTP Server
- ♦ QuickFinder Server
- ♦ WAN Traffic Manager Services
- ♦ Novell DNS/DHCP Services
- ♦ Novell iFolder Storage Services
- ♦ eDirectory SNMP Subagent
- ♦ MySQL
- ♦ Tomcat 5 Servlet Container
- ♦ exteNd Application Server
- ♦ Novell Nsure UDDI Server
- ♦ Novell Nsure Audit Starter Pack
- ♦ iSCSI Target
- ♦ Refresh native File Access Login Methods
- ♦ Novell netstorage
- ♦ OpenSSH
- ♦ WAN Connectivity
- ♦ eGuide
- ♦ Novell iManager
- ♦ Novell Virtual Office

Selecting a component adds that component to the list of software to be installed or upgraded as part of the server upgrade. Deselecting removes the component from the list of products and services to be installed, but does not cause the component to be uninstalled if it already exists on the server.

- 1** Select the components you want to be installed or upgraded. When you select a component, a description of that component is displayed in the Description box.

To select all available components, select *Select All*.

To deselect all components, select *Clear All*.

- 2** Click *Next*.

Saving the Response File

In order to use the response file generated by this utility, it must be saved to a location where the install can find it. Saving the response file to a floppy disk is recommended.

- 1** Type the response file name in the field provided.

- 2 In the *Temporary Response File Location* field, type a local path or click the *Browse* icon and browse to the location where you want to save the response file.

The default is A : \.

- 3 In the *Response File and Licenses Install Location* field, type the path where the NetWare installation program should look for the response file and server license file.

The default is A : \. If you plan to copy the response file and license to another location, such as a folder on the server's C: drive, be sure to do so before you run the automated install or upgrade.

- 4 (Optional) Provide a customized description for this response file by typing it in the field provided.

- 5 Click *Next*.

The generated response file is saved to the specified location and is now ready to be used for a response file installation or upgrade.

A.5 Response File Syntax

This section describes the NetWare installation response file syntax and lists the sections and keys you can include in a response file.

- ♦ [Section A.5.1, "Syntax Overview," on page 125](#)
- ♦ [Section A.5.2, "The Prompt Key," on page 125](#)
- ♦ [Section A.5.3, "Response File Sections and Keys," on page 126](#)
- ♦ [Section A.5.4, "Automating the Installation of Additional Products and Services," on page 172](#)
- ♦ [Section A.5.5, "Calling an Install Script During a Response File Installation," on page 179](#)

A.5.1 Syntax Overview

A NetWare response file is similar to a Windows `.ini` file in that data items are identified as keys, and keys have associated values (*Key = value*). These keys are grouped in sections. Each data input screen in the NetWare installation program has one or more sections associated with it. The section names generally correspond to the function of the screens.

Section and key names are case sensitive. Values associated with keys are not case sensitive. Semicolons placed at the beginning of a line indicate that the line is a comment.

Sections can be placed in any order within the response file. However, if there are two or more sections with the same section name, the first section listed in the response file is used and the duplicate sections are ignored.

A.5.2 The Prompt Key

The Prompt key listed with most sections controls whether the corresponding data input screen is displayed when the NetWare installation program runs.

If the value of Prompt is True, the screen is displayed and the data specified in the response file is presented as default values. The screen is not displayed if the value of Prompt is False. If any of the required data is missing in the response file, however, the screen is shown regardless of the Prompt value.

In the following example, when the install program runs the data input screen is displayed with the eDirectory™ (NDS®) configuration information already filled in. The Summary screens are also displayed.

```
[NWI:NDS]
Prompt = True
Tree Name = Novell
New Tree = True
Server Context = O=Utah
Admin Context = O=Utah
Admin Login Name = Admin
Admin Password = install
Display Summary = True
```

In the following example, when the install program runs the eDirectory (NDS) input screen and the Summary screens are not displayed and the program bypasses them.

```
[NWI:NDS]
Prompt = False
Tree Name = Novell
New Tree = True
Server Context = O=Utah
Admin Context = O=Utah
Admin Login Name = Admin
Admin Password = install
Display Summary = False
```

A.5.3 Response File Sections and Keys

The NetWare installation sections and their associated keys are specified below. Each listing includes a short description of its purpose, the default value, the possible values, and whether the key is required for the NetWare installation to run silently (for example, to create a new eDirectory tree without any user input, `New Tree=True` must appear in the response file). Also included with each key is an example of how it might appear in an actual response file.

Table A-2 lists the sections that apply to the NetWare server installation. They are listed in the order they appear in the install program.

Table A-2 *Response File Sections for NetWare Server Installation*

Section	Purpose
[NWI:Product Information] Section (page 128)	Identifies the specific product version the response file is associated with.
[NWI:Language] Section (page 129)	Specifies the languages to be installed on the server.
[NWI:Install Options] Section (page 130)	Corresponds to the first data input screen.
[NWI:Server Settings] Section (page 133)	Corresponds to the server settings screen.
[NWI:Boot Partition] Section (page 133)	Corresponds to the boot partition screen.
[NWI:Locale] Section (page 134)	Corresponds to the regional settings screen.

Section	Purpose
[NWI:Mouse and Video] Section (page 135)	Corresponds to the video and mouse settings screen.
[NWI:Excluded From Detection] Section (page 136)	Identifies what drivers will be excluded from the auto-detection.
[NWI:Multi-Processor System] Section (page 136)	Identifies the driver associated with the processor system in the server.
[NWI:Storage Adapter <i>n</i>] Section (page 137)	Identifies the driver and its associated parameters for a specific storage adapter. This section can be duplicated for as many adapters as are in the server. <i>n</i> uniquely identifies the sequence of the section (1, 2, etc.).
[NWI:Storage Device <i>n</i>] Section (page 138)	Specifies storage devices. This section can be duplicated for as many devices as are in the server. <i>n</i> uniquely identifies the sequence of the section (1, 2, etc.).
[NWI:Network Adapter <i>n</i>] Section (page 138)	Identifies the driver and its associated parameters for a specific network adapter. This section can be duplicated for as many devices as are in the server. <i>n</i> uniquely identifies the sequence of the section (1, 2, etc.).
[NWI:Reserved Adapter <i>n</i>] Section (page 140)	Specifies the adapters that are to be reserved.
[NWI:Hotplug System] Section (page 141)	Identifies the driver associated with the processor system in the server.
[NWI:NetWare Loadable Module] Section (page 141)	Identifies NLM™ programs that are to be loaded with the hardware drivers.
[NWI:Pool Sys] Section (page 141)	Specifies attributes of the sys: pool and sys: volume.
[NWI:Pool <i>n</i>] Section (page 143)	Specifies attributes of pools to be created, other than sys:.
[NWI:Volume <i>n</i>] Section (page 143)	Specifies attributes of volumes to be created, other than sys:.
[NWI:Pool Data] Section (page 144)	Specifies attributes of the data pool and data volume.
[NWI:Misc] Section (page 145)	Functions as a container of parameters that do not correspond to a data input screen.
[NWI:File Server] Section (page 148)	Specifies the parameters that uniquely identify the server.
[NWI:Protocols] Section (page 149)	Controls whether the protocol screen is displayed.
[NWI:TCPIP] Section (page 150)	Specifies TCP/IP parameters.
[NWI:IPX] Section (page 151)	Specifies IPX parameters.
[NWI:IPCMD] Section (page 152)	Specifies Compatibility Mode parameters.
[NWI:DNS] Section (page 153)	Specifies Domain Name Service (DNS) parameters.
[NWI:Host Name] Section (page 154)	Specifies the DNS Host Name for each IP address.

Section	Purpose
[NWI:Time Zone] Section (page 155)	Corresponds to the time zone screen.
[NWI:Time Synchronization] Section (page 155)	Specifies time server configuration.
[NWI:NDS] Section (page 156)	Corresponds to the NDS screen.
[NWI:License] Section (page 159)	Identifies the location of the license file.
[Tomcat4] Section (page 161)	Determines whether the Tomcat installation displays error/dependency messages or simply logs the error.
[j2ee] Section (page 161)	Corresponds to the exteNd Application Server screens.
[MySQL] Section (page 164)	Corresponds to the MySQL screen.
[iStorage] Section (page 165)	Corresponds to the netstorage screen.
[NWI:Add to Startup] Section (page 168)	Specifies SET parameters to be added to the NetWare registry.
[NWI:Append To Autoexec.ncf] Section (page 168)	Specifies lines to be added to the middle of the <code>autoexec.ncf</code> file.
[NWI End:Append To Autoexec.ncf] (page 169)	Specifies lines to be added to the end of the <code>autoexec.ncf</code> file.
[NWI:Comment Out Line In Autoexec.ncf] (page 169)	Specifies lines to be comment out in the <code>autoexec.ncf</code> file.
[NWI:Use NCF Settings] Section (page 169)	Specifies whether to use the response file or the <code>autoexec.ncf</code> file for the server name during an upgrade.
[NOVELL: NOVELL_ROOT:1.0.0] Section (page 170)	Specifies information for a fully automated installation.
[Initialization] Section (page 171)	Specifies initialization information for silent server installations.
Entries for Additional Products and Services (page 173)	Specifies information for a fully automated installation of products and services.
[NWI:LdapConfig] Section for LDAP Configuration (page 177)	Specifies information for a fully automated installation of LDAP Services for Novell eDirectory.
[DNS_DHCP] Section for DNS/DHCP Configuration (page 177)	Specifies information for a fully automated installation of DNS/DHCP Services for Novell eDirectory.
Calling an Install Script During a Response File Installation (page 179)	Specifies information for calling an install script for customized installations.

[NWI:Product Information] Section

This section identifies the major and minor version of the NetWare operating system to be installed.

Major Version = *string*

Purpose	Specifies the name of the product that this response file is associated with. If this value does not match that of the NetWare default response file (normally found in the install directory on the CD), the installation does not continue.
Default	NetWare 6
Values	<i>operating system name</i>
Key Required	Yes
Example	Major Version = NetWare 6

Minor Version = *integer*

Purpose	Specifies the revision level of the product. If this value does not match that of the NetWare default response file (normally found in the INSTALL directory on the CD image), the installation does not continue.
Default	50
Values	0 to 99
Key Required	Yes
Example	Minor Version = 50

Small Business = *string*

Purpose	Controls whether the Small Business licensing model is used.
Default	False
Value	True, False
Key Required	No
Example	Small Business = True

[NWI:Language] Section

This section specifies information about the server languages.

Prompt = *string*

Purpose	Controls whether the Language selection screen is displayed.
Default	True
Values	True, False
Key Required	Yes
Example	Prompt = True

Server Language = *integer*

Purpose	Specifies the default language of the server and the language that the installation screens are displayed in.
Default	4 (English)
Values	1 to 100 (values are specified in <code>install\profile.txt</code>)
Key Required	Yes
Example	Server Language = 4

Additional Languages = *integers_separated_by_commas*

Purpose	Specifies additional languages to be installed on the server.
Default	(none)
Values	1 to 100 (values are specified in <code>install\profile.txt</code>)
Key Required	No
Example	Additional Languages = 5,6

[NWI:Install Options] Section

This section specifies values for various installation options.

Prompt = *string*

Purpose	Controls whether the Install Options screen is displayed.
Default	True
Values	True, False
Key Required	Yes
Example	Prompt = True

Backup = *string*

Purpose	Controls whether to back up the startup directory (<code>c:\nwserver</code>) before doing an upgrade.
Default	True
Values	True, False
Key Required	Yes
Example	Backup = True

Backup Dir = *string*

Purpose	Specifies the path for backing up the startup directory.
Default	c:\nwserver.old
Values	DOS_path_up_to_255_characters
Key Required	No
Example	Backup Dir = c:\nwserver.old

Allow Unsupported Drivers = *string*

Purpose	If Yes is specified, then drivers that have not been tested and approved for NetWare are automatically selected and loaded if no other drivers are available.
Default	No
Values	Yes, No
Key Required	No
Example	Allow Unsupported Drivers = No

Upgrade = *string*

Purpose	Specifies whether the installation is an upgrade or a new installation. False specifies a new installation; True specifies an upgrade.
Default	False
Values	True, False
Key Required	Yes
Example	Upgrade = False

Add StartX = *string*

Purpose	Specifies whether to add StartX to the autoexec.ncf file. If False, the GUI server screen does not load by default.
Default	True
Values	True, False
Key Required	No
Example	Add StartX = True

Express = *string*

Purpose	Specifies whether the installation uses the Default (formerly Express) or Manual (formerly Custom) mode of installation. False specifies Manual rather than Default.
---------	--

Default	True
Values	True, False
Key Required	Yes
Example	Express =True

Startup Directory = *string*

Purpose	Identifies the directory where the server initialization files are to reside on the boot partition.
Path	c:\nwserver
Values	<i>existing_DOS_path_up_to_255_characters</i>
Key Required	Yes
Example	Startup Directory = c:\nwserver

Allow User Response File = *string*

Purpose	Makes the F3 key available on the opening screen, which lets a user input a path to an additional response file.
	NOTE: Values in a user response file override the values of other response files passed in previously to the installation program.
Default	True
Values	True, False
Key Required	No
Example	Allow User Response File = True

Abort on Error = *string*

Purpose	Specifies whether the installation halts when an error is encountered during an unattended installation. The user normally sees an error screen if this key is set to False.
Default	False
Values	True, False
Key Required	No
Example	Abort on Error = True

Use Unsupported Drivers = *string*

Purpose	This selection allows drivers that have not been tested and approved for this OS to be automatically selected and loaded if no other drivers are available. This should be used with caution.
---------	---

Default	False
Values	True, False
Key Required	No
Example	Use Unsupported Drivers = False

[NWI:Server Settings] Section

This section specifies various server settings.

Prompt = *string*

Purpose	Controls whether the Server Settings screen is displayed.
Default	True
Values	True, False
Key Required	Yes
Example	Prompt = True

Load Server at Reboot = *string*

Purpose	Adds new <code>autoexec.bat</code> and <code>config.sys</code> files that set a minimal DOS environment and automatically load the server. Preexisting <code>autoexec.bat</code> and <code>config.sys</code> files on the server are renamed to <code>*.000</code> . If this value is set to True and <code>autoexec.000</code> already exists, then <code>autoexec.bat</code> is renamed to <code>autoexec.001</code> , etc.
Default	True
Values	True, False
Key Required	No
Example	Load Server at Reboot = True

CD Driver = *string*

Purpose	Determines the driver type (DOS or server) used to access the CD during installation.
Default	NetWare
Values	NetWare, DOS
Key Required	No
Example	Source Media Access = NetWare

[NWI:Boot Partition] Section

This section specifies information about the DOS boot partition.

Prompt = *string*

Purpose	Controls whether the boot partition screen displays.
Default	True
Values	True, False
Key Required	Yes
Example	Prompt = True

Boot OS = *string*

Purpose	If NetWare is selected and DOS is the OS that normally boots when the system comes up, the installation modifies the boot sector to load NetWare instead of DOS. If DOS is selected and NetWare is the boot OS, the installation restores the DOS boot sector.
Default	DOS
Values	DOS, NetWare
Key Required	No
Example	Boot OS = DOS

Delete All Partitions = *string*

Purpose	Specifies whether to delete all partitions on the boot disk before creating the DOS partition.
Default	False
Values	True, False
Key Required	No
Example	Delete All Partitions = False

DOS Partition Size = *integer*

Purpose	Specifies the size (in megabytes) of the DOS partition.
Default	500
Values	<i>any_integer</i>
Key Required	No
Example	DOS Partition Size = 2048

[NWI:Locale] Section

This section specifies information about the country, code page, and keyboard for the server.

Prompt = *string*

Purpose	Controls whether the screen is displayed.
Default	True
Values	True, False
Key Required	Yes
Example	Prompt = True

Country Code = *integer*

Purpose	Specifies the country-oriented settings for display.
Default	001
Values	(Values are specified in <code>install\nls\language number\locale.txt.</code>)
Key Required	Yes
Example	Country Code = 001

Code Page = *integer*

Purpose	Sets the character set for the server.
Default	437
Values	(Values are specified in <code>install\nls\language number\locale.txt.</code>)
Key Required	Yes
Example	Code Page = 437

Keyboard = *string*

Purpose	Sets the keyboard type.
Default	United States
Values	(values are specified in <code>install\nls\<language number>\locale.txt.</code>)
Key Required	Yes
Example	Keyboard = United States

[NWI:Mouse and Video] Section

This section specifies the type of mouse and video resolution for the server.

Prompt = *string*

Purpose	Controls whether the screen is displayed.
---------	---

Default	True
Values	True, False
Key Required	Yes
Example	Prompt = True

Mouse = *string*

Purpose	Specifies the mouse type to be used for the graphical portion of the installation. If Auto is specified, it is auto-detected.
Default	Auto
Values	PS/2*, Serial COM1, Serial COM2, Auto, No Mouse (values are specified in install\nls\language number\locale.txt.)
Key Required	No
Example	Mouse = Auto

Video Type = *string*

Purpose	Indicates the video resolution for the Java GUI on the server.
Default	PlugNPlay
Values	PlugNPlay, 800x600, 640x480
Key Required	No
Example	Video Type = PlugNPlay

[NWI:Excluded From Detection] Section

This section identifies drivers to be excluded from auto-detection.

Driver File = *filename*

Default	(none)
Values	<i>name_of_driver</i>
Key Required	No
Example	Driver File =aha2940.ham
Purpose	Identifies the driver to be excluded from auto-detection.

[NWI:Multi-Processor System] Section

This section identifies the driver to use for a server with multiple processors.

Driver File = *filename*

Purpose	Identifies the driver to use for the server's multiprocessor system.
Default	(none)
Values	<i>name_of_driver</i>
Key Required	No
Example	Driver File = mps14.psm

[NWI:Storage Adapter *n*] Section

One of these sections can be included for each storage adapter in the server. Use a single-digit number in place of *n* to distinguish among multiple adapters; for example, NWI:Storage Adapter 1.

Several keys described under this section are optional; if the driver is detectable by NetWare, only the Driver File key is required for the section. The other keys and values are varied and are extracted from the driver's corresponding DDI file.

Driver File = *filename*

Purpose	Identifies the driver to use for the storage adapter.
Default	(none)
Values	<i>name_of_driver</i>
Key Required	No, unless Storage Detection = False
Example	Driver File = aha2940.ham

SLOT = *integer*

Purpose	Specifies the bus slot of the storage adapter that the driver should be loaded to.
Default	(none)
Values	(Can be a 5-digit Hardware Instance Number assigned on servers with buses that support detection—such as PCI.)
Key Required	No, unless the driver is for an ISA adapter.
Example	SLOT = 2

INT = *hexadecimal_number*

Purpose	Specifies the interrupt that the adapter is set to; this parameter is commonly used for ISA bus adapters.
Default	(none)
Values	1 to F
Key Required	No, unless the driver is for an ISA adapter.

Example	INT = F
<hr/>	
PORT = <i>number</i>	
<hr/>	
Purpose	Specifies the memory address the adapter is set to; this parameter is commonly used for ISA bus adapters.
Default	(none)
Values	<i>3-digit_memory_address</i>
Key Required	No, unless the driver is for an ISA adapter.
Example	PORT = 170

[NWI:Storage Device *n*] Section

One of these sections can be included for each storage device in the server. Use a single-digit number in place of *n* to distinguish among multiple devices; for example, NWI:Storage Device 1.

Driver File = *filename*

Purpose	Identifies the driver to use for the storage device.
Default	(none)
Values	<i>name_of_driver</i>
Key Required	No, unless Device Detection = False
Example	Driver File = idecd.cdm

[NWI:Network Adapter *n*] Section

One of these sections can be included for each network adapter in the server. Use a single-digit number in place of *n* to distinguish among multiple adapters; for example, NWI:Network Adapter 1.

Several keys described under this section are optional; if the driver is detectable by NetWare, only the Driver File key is required for the section. The other keys and values are varied and are extracted from the driver's corresponding LDI file.

Driver File = *filename*

Purpose	Identifies the driver to use for the network adapter.
Default	(none)
Values	<i>name_of_driver</i>
Key Required	No, unless Network Detection = False
Example	Driver File = 3c59x.lan

SLOT = *integer*

Purpose	Specifies the bus slot of the network adapter that the driver should be loaded to.
Default	(none)
Values	(Can be a 5-digit Hardware Instance Number assigned on servers with buses that support detection—such as PCI.)
Key Required	No, unless the driver is for an ISA adapter.
Example	SLOT = 10001

INT = *hexadecimal_number*

Purpose	Specifies the interrupt that the adapter is set to; this parameter is commonly used for ISA bus adapters.
Default	(none)
Values	1 to F
Key Required	No, unless the driver is for an ISA adapter.
Example	INT = F

PORT = *number*

Purpose	Specifies the memory address the adapter is set to; this parameter is commonly used for ISA bus adapters.
Default	(none)
Values	<i>3-digit_memory_address</i>
Key Required	No, unless the driver is for an ISA adapter.
Example	PORT = 170

Adapter Name = *string*

Purpose	Specifies a unique name for this adapter.
Default	(none)
Values	(Text up to 255 characters.)
Key Required	No
Example	Adapter Name = 3C59X_1

Frame Type *n* = *frame_type*

Purpose	Identifies the network frame type to be used when loading the driver. There can be as many descriptions as there are frame types supported by the driver. <i>n</i> uniquely identifies the frame type (1, 2, etc.).
---------	---

Default	(none)
Values	(Frame types supported by the driver are found in the driver's LDI file.)
Key Required	No
Example	Frame Type 1 = Ethernet_802.2

Logical Name n = *string*

Purpose	Identifies the name to be used when binding a protocol to a frame type on this adapter. There must be a logical name for each frame type loaded with the driver. n uniquely identifies the frame type (1, 2, etc.).
Default	(none)
Values	(Text combining the Frame Type with the Adapter Name.)
Key Required	No
Example	Logical Name 1 = 3C59X_1_E82

Octet Bit Order = *string*

Purpose	Specifies the bit order (Least Significant Bit or Most Significant Bit) that this network adapter uses for deciphering the node address.
Default	LSB
Values	LSB, MSB
Key Required	No
Example	Octet Bit Order = LSB

[NWI:Reserved Adapter n] Section

One of these sections can be included for each bus slot in the server that you want to be reserved. Use a single-digit number in place of n to distinguish among multiple adapters; for example, NWI:Reserved Adapter 1.

SLOT = *integer*

Purpose	Specifies the bus slot that should be reserved. If an adapter is found in this slot, an error is generated.
Default	(none)
Values	Can be a 5-digit Hardware Instance Number assigned on servers with buses that support detection, such as PCI.
Key Required	No, unless the driver is for an ISA adapter.
Example	SLOT = 5

[NWI:Hotplug System] Section

This section identifies the driver to use for the Hot Plug system.

Driver File = *filename*

Purpose	Identifies the driver to use for the Hot Plug system.
Default	(none)
Values	<i>name_of_driver</i>
Key Required	No, unless HotPlug Detection = False
Example	Driver File = cpqsbd.nlm

[NWI:NetWare Loadable Module] Section

This section identifies NLM programs to load during installation.

Driver File = *filename*

Purpose	Identifies the NLM to load during installation. This is typically used for network support NLM programs.
Default	(none)
Values	<i>name_of_NLM</i>
Key Required	No
Example	Driver File = route.nlm

[NWI:Pool Sys] Section

This section specifies information about the sys: pool.

Sys Pool Size = *integer*

Purpose	Specifies the size (in megabytes) of pool sys:. Volume sys: is created and uses this pool.
Default	4000
Values	<i>integer</i>
Key Required	No
Example	Sys Pool Size = 4000

Device ID = *string*

Purpose	Specifies which disk the sys: volume and pool is on.
Default	(none)
Values	<i>string</i>

Key Required	No
Example	Device ID = [V025-A1-00:0] Maxtor 9136604

SYS ON DOS DRIVE = *string*

Purpose	Specifies whether pool sys: is created on the drive with the DOS partition if there is enough space.
Default	True
Values	True, False
Key Required	No
Example	SYS ON DOS DRIVE = True

Remove Old Partitions = *string*

Purpose	Specifies whether to delete old NetWare partitions. If False, no partitions are removed.
Default	True
Values	True, False
Key Required	No
Example	Remove Old Partitions = True

Remove Only SYS Partitions = *string*

Purpose	Specifies to remove only the SYS partitions if set to True. The Remove Old Partitions key must be set to True in order to set Remove Only SYS Partitions to True. If the Remove Old Partitions key is set to False, this key is not read.
Default	False
Values	True, False
Key Required	No
Example	Remove Only SYS Partitions = False

Remove Shared Partitions = *string*

Purpose	Specifies to delete partitions on shared devices if set to True. The Remove Old Partitions key must be set to True in order to set the Remove Shared Partitions key to True. If the Remove Old Partitions key is set to False, the Remove Shared Partitions key is not read.
Default	False
Values	True, False
Key Required	No

Example	Remove Shared Partitions = False
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[NWI:Pool *n*] Section

One of these sections can be included for each pool you want to create on the server. Use a single-digit number in place of *n* to distinguish among multiple pools; for example, NWI:Pool 1.

Name = *string*

Purpose	Specifies the name of the pool to create. If you use this section, this key is required.
Default	(none)
Values	<i>poolname</i>
Key Required	No
Example	Name = testpool1

Size = *integer*

Purpose	Specifies the size (in megabytes) of the pool to create. If you create a pool, this key is required.
Default	(none)
Values	<i>integer</i>
Key Required	No
Example	Size = 2000

[NWI:Volume *n*] Section

One of these sections can be included for each volume other than sys: you want to define on the server. This section allows volumes to be created on specific partitions in the system during installation. The partitions are specified by the key entries in the section. Use zero-based sequence numbers (*n* = 0, 1, 2, 3, ...) to specify the order in which the volumes are to be created; for example, use NWI:Volume 0 for the first volume after sys: to be created.

Name = *string*

Purpose	Specifies the name of the volume to be created. If you use this section to create a volume, this key is required.
Default	(none)
Values	<i>volume_name</i>
Key Required	No
Example	Name = testvolume1

Pool Name = *string*

Purpose	Specifies the name of the pool to be used. This references the pool that was created in the [NWI:Pool n] Section (page 143) .
Default	(none)
Values	<i>poolname</i>
Key Required	No
Example	Name = testpool1

[NWI:Pool Data] Section

This section lets you create a data volume on the same disk as volume sys: and use the remaining disk space not consumed by sys:. This section creates a pool and a volume.

Size = *integer*

Purpose	Specifies the size (in megabytes) of the pool and volume.
Default	(none)
Values	<i>integer</i>
Key Required	No
Example	Size = 2000

Minimum Size = *integer*

Purpose	Specifies the minimum size (in megabytes) of the pool and volume.
Default	(none)
Values	<i>integer</i>
Key Required	No
Example	Minimum Size = 2000

Device ID = *string*

Purpose	Specifies the device ID for the hardware that the pool and volume will reside on.
Default	(none)
Values	<i>string</i>
Key Required	No
Example	Device ID = [V025-A1-00:0] Maxtor 9136604

Name = *string*

Purpose	Specifies the name of the pool and volume.
Default	(none)
Values	<i>pooldataname</i>
Key Required	No
Example	Name = testpool1

Data On Sys Drive = *string*

Purpose	Specifies whether the sys: drive is preferred over other drives.
Default	True
Values	True, False
Key Required	No
Example	Data On Sys Drive = True

Expand To Fill Disk = *string*

Purpose	Directs the pool and volume to use the remaining disk space on the specified disk.
Default	True
Values	True, False
Key Required	No
Example	Expand To Fill Disk = True

[NWI:Misc] Section

When the keys in this section are properly used, the install bypasses the reauthentication screen that normally appears during a remote install or upgrade.

Source Server Name = *string*

Purpose	Specifies the name of the server containing the NetWare installation source files for a silent install or upgrade.
Default	(none)
Values	<i>NetWare_server_name</i>
Key Required	Yes
Example	Source Server Name = server1

Source Location Path = *string*

Purpose	Specifies the location of the NetWare installation source files on the source server for a silent install or upgrade.
Default	(none)
Values	<i>valid_pathname</i>
Key Required	Yes
Example	Source Location Path = sys:nw65inst

Source Domain Address = *string*

Purpose	Specifies the IP address of the server containing the NetWare installation source files for a silent install or upgrade.
Default	(none)
Values	<i>valid_IP_address</i>
Key Required	Yes
Example	Source Domain Address = 130.1.130.1

Source Domain Address Type = *string*

Purpose	Specifies the protocol type of the source server's IP address for a silent install or upgrade.
Default	UDP
Values	UDP, TCP (may support other protocols, such as IPX, in the future)
Key Required	Yes
Example	Source Domain Address Type = UDP

Source Tree Name = *string*

Purpose	Specifies the eDirectory tree name for the server containing the NetWare installation source files for a silent install or upgrade.
Default	(none)
Values	<i>eDirectory_tree_name</i>
Key Required	Yes
Example	Source Tree Name = Acme_Tree

Source Server Context = *string*

Purpose	Specifies the eDirectory context of the server containing the NetWare installation source files, in dot-delimited or fully distinguished format.
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Default	(none)
Values	<i>valid_eDirectory_context</i>
Key Required	Yes
Example	Source Server Context = install.novell

Source User Name = *string*

Purpose	Specifies the Common Name of the user account to use when logging in to the source eDirectory tree during a silent install or upgrade.
Default	(none)
Values	<i>username</i>
Key Required	Yes
Example	Source User Name = admin

Source Context = *string*

Purpose	Specifies the context of the user account to use when logging in to the source eDirectory tree during a silent install or upgrade.
Default	(none)
Values	<i>eDirectory_context</i>
Key Required	Yes
Example	Source Context = install.novell

Relogin Password = *string*

Purpose	Specifies the password for the user connection being used during a silent install or upgrade, or when installing across the network.
Default	(none)
Values	<i>text</i>
Key Required	Yes
Example	Relogin Password = Novell

[Installation Type] Section

NOTE: This section appears only in OES FCS for NetWare and NetWare 6.5 SP3 installations. It is the first section used during the graphical portion of the installation. This selection was removed in OES SP2 for NetWare.

Prompt = *string*

Purpose	Controls whether the Select Installation Type screen is displayed.
Default	True
Values	True, False
Key Required	Yes
Example	Prompt = False

Default OES Install = *string*

Purpose	Sets whether you want the NetWare install program to use Open Enterprise Server defaults for a manual installation.
Default	True
Values	True, False
Key Required	No
Example	Default OES Install = True

Default OES Upgrade = *string*

Purpose	Sets whether you want the NetWare install program to use Open Enterprise Server defaults for a manual upgrade.
Default	True
Values	True, False
Key Required	No
Example	Default OES Upgrade = True

[NWI:File Server] Section

This section specifies the NetWare server's name and ID number..

Prompt = *string*

Purpose	Controls whether the screen is displayed.
Default	True
Values	True, False
Key Required	Yes
Example	Prompt = True

Servername = *string*

Purpose	Specifies the name of the server. Note that a server is brought up with a temporary name until a valid servername is entered.
Default	(none)
Values	(Text between 2 and 47 alphanumeric characters, can contain underscores (_) and hyphens (-), but no spaces. The first character cannot be a period (.))
Key Required	Yes
Example	Servername = Novell

Server ID Number = *hexadecimal_number*

Purpose	Uniquely identifies the server for network communication purposes. Note that this number should not conflict with any existing IPX addresses on your network.
Default	(randomly generated)
Values	00000001 to FFFFFFFF
Key Required	Yes (if IPX is selected)
Example	Server ID Number = 01010101

[NWI:Protocols] Section

This section specifies information about the protocols to be installed on the server.

Prompt = *string*

Purpose	Controls whether the protocols screen is displayed.
Default	True
Values	True, False
Key Required	Yes
Example	Prompt = True

Single Network Adapter = *string*

Purpose	If this key is set to True, then in the [NWI:TCPIP] and [NWI:IPX] sections of the response file the Logical Name 1 key is automatically filled in with the logical name of the first network card found in the system. The logical name is then bound to the TCP/IP and IPX addresses specified in the [NWI:TCPIP] and [NWI:IPX] sections of the response file.
Default	False
Values	True, False
Key Required	No

Example	Single Network Adapter = True
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Default IP Frame Type = *string*

Purpose	Identifies the network frame type to be bound to the IP stack when Single Network Adapter is set to True.
Default	(none)
Values	(Frame types that are supported by a driver are found in the driver's LDI file.)
Key Required	No
Example	Default IP Frame Type = Ethernet II

Default IPX Frame Type = *string*

Purpose	Identifies the network frame type to be bound to the IPX stack when Single Network Adapter is set to True.
Default	(none)
Values	(Frame types that are supported by a driver are found in the driver's LDI file.)
Key Required	No
Example	Default IPX Frame Type = Ethernet 802.2

[NWI:TCPIP] Section

This section specifies information about TCP/IP.

Logical Name *n* = *string*

Purpose	Identifies the name of the adapter and frame type that the protocol is to be bound to.
Default	(none)
Values	Name identified in the Network Adapter sections of the response file.
Key Required	No, unless IP is to be bound.
Example	Logical Name 1 = 3C59X_1_EII

IP Address *n* = *decimal_number*

Purpose	Specifies the IP address to be bound.
Default	(none)
Values	<i>valid_IP_address</i>
Key Required	No, unless Logical Name is set.
Example	IP Address 1 = 130.1.130.1

Subnet Mask $n = decimal_number$

Purpose	Specifies the subnet. Divides the IP address into network address and node address.
Default	(none)
Values	<i>valid_IP_address</i>
Key Required	No, unless Logical Name is set.
Example	Subnet Mask 1 = 255.255.255.0

Gateway $n = decimal_number$

Purpose	Identifies the gateway or router through which this server can communicate outside the subnet.
Default	(none)
Values	<i>valid_IP_address</i>
Key Required	No
	Gateway 1 = 127.127.0.254

[NWI:IPX] Section

This section specifies information about IPX.

Prompt = *string*

Purpose	Controls whether the IPX screen is displayed.
Default	True
Values	True, False
Key Required	Yes
Example	Prompt = True

Logical Name $n = string$

Purpose	Identifies the logical name of the adapter and frame type that the protocol is to be bound to.
Default	(none)
Values	Name identified in the Network Adapter sections of the response file.
Key Required	No, unless IPX is to be bound
Example	Logical Name 1 = 3C59X_1_E82

Bind LAN Card *n* = *string*

Purpose	Specifies whether to bind the specified network adapter (LAN card) to an IPX segment address. If no matching IPX Address key is specified for this adapter, it is bound to the first auto-detected IPX segment address.
Default	True
Values	True, False
Key Required	No, unless IPX is to be bound
Example	Bind LAN Card 1 = True

IPX Address *n* = *hexadecimal_number*

Purpose	Specifies the IPX address the network adapter (LAN card) is bound to.
Default	(Address detected by the installation program.)
Values	00000001 to FFFFFFFF
Key Required	No
Example	IPX Address 1 = 1FACE123

[NWI:IPCMD] Section

This section specifies information about IPX compatibility.

IPX Compatibility = *string*

Purpose	Controls whether SCMD is loaded on this server.
Default	True
Values	True, False
Key Required	No
Example	IPX Compatibility = True

Migration Agent = *string*

Purpose	Controls whether the Migration Agent (SCMD /MA) is loaded on this server.
Default	True
Values	True, False
Key Required	No
Example	Migration Agent = True

CMD Net Number = *string*

Purpose	Specifies the network number.
Default	(none)
Values	00000001 to FFFFFFFF
Key Required	No
Example	CMD Net Number = 01010101

Preferred IP Address = *decimal_number*

Purpose	Specifies the IP address.
Default	(none)
Values	<i>valid_IP_address</i>
Key Required	No
Example	Preferred IP Address = 130.1.130.1

[NWI:DNS] Section

This section specifies information about DNS.

Prompt = *string*

Purpose	Controls whether the DNS screen is displayed.
Default	True
Values	True, False
Key Required	Yes
Example	Prompt = True

Domain = *string*

Purpose	Specifies a domain.
Default	(none)
Values	<i>text</i>
Key Required	No
Example	Domain = novell.com

Nameservers = *decimal_numbers_separated_by_commas*

Purpose	Identifies the servers to be used for name resolution.
---------	--

Default	(none)
Values	<i>valid_IP_addresses</i>
Key Required	No
Example	Nameservers = 131.1.131.1, 131.1.131.2

[NWI:Host Name] Section

This section specifies information about the DNS host names.

Prompt = *string*

Purpose	Controls whether the screen is displayed.
Default	True
Values	True, False
Key Required	Yes
Example	Prompt = True

Host Name *n* = *string*

Purpose	Specifies the hostname associated with an IP address already bound.
Default	(none)
Values	<i>text</i>
Key Required	No
Example	Host Name 1 = install.novell.com

IP Address *n* = *decimal_number*

Purpose	Specifies the IP address associated with a hostname. Note that Host Name 1 will be set as the Primary address.
Default	(none)
Values	<i>valid_IP_address</i>
Key Required	No
Example	IP Address 1 = 130.1.130.1

Verify = *string*

Purpose	Controls whether the installation contacts the DNS server to verify that the IP address matches the hostname. We recommend leaving this set to False (does not contact).
Default	False

Values	True, False
Key Required	No
Example	Verify = False

[NWI:Time Zone] Section

This section specifies information about the server's time zone.

Prompt = *string*

Purpose	Controls whether the time zone screen is displayed.
Default	True
Values	True, False
Key Required	Yes
Example	Prompt = True

Time Zone = *string*

Purpose	Specifies the standard time zone. Note that the exact 3-or 4-letter time zone acronym from comothr.ils (in <code>install\nls\4</code>) must be used.
Default	(none)
Values	<i>string</i>
Key Required	Yes
Example	Time Zone = EDT

Use Daylight Saving Time = *string*

Purpose	Controls whether daylight saving time is used.
Default	True, if Time Zone supports Daylight Saving Time.
Values	True, False
Key Required	No
Example	Use Daylight Saving Time = True

[NWI:Time Synchronization] Section

This section specifies information about time synchronization.

Prompt = *string*

Purpose	Controls whether the screen is displayed.
Default	True

Values	True, False
Key Required	Yes
Example	Prompt = True

Default Time Server Type = *string*

Purpose	Specifies the time server type.
Default	Single if new tree, Secondary if existing tree.
Values	Single, Primary, Secondary
Key Required	No
Example	Default Time Server Type = Single

Time Server Protocol = *string*

Purpose	Specifies the time server protocol. If NTPv3 is selected, you must include at least one time source server.
Default	timesync
Values	ntp3, timesync
Key Required	No
Example	Time Server Protocol = timesync

Time Source n = *string*

Purpose	Specifies up to three time source servers by IP address, DNS name, or Server ID (IPX servers only). If an IP address is entered, port number 123 is appended to the address.
Default	(none)
Values	valid_IP_address, DNS_name, Server_ID
Key Required	Yes, if NTPv3 is selected as the time server protocol.
Example	Time Source 1 = 123.45.67.89:123

[NWI:NDS] Section

This section specifies information about eDirectory (NDS).

Prompt = *string*

Purpose	Controls whether the NDS (eDirectory) screen is displayed.
Default	True
Values	True, False

Key Required	Yes
Example	Prompt = True

Tree Name = *string*

Purpose	Specifies the tree name for either a new tree or an existing tree to install the server into.
Default	(none)
Values	<i>text</i>
Key Required	Yes
Example	Tree Name = Novell

New Tree = *string*

Purpose	Specifies whether to install the server into a new tree or to install it into an existing tree. This key is used only when Prompt = False.
Default	False
Values	True, False
Key Required	Yes
Example	New Tree = True

Server Context = *string*

Purpose	Identifies the eDirectory context that the server is to be installed into.
Default	(none)
Values	<i>eDirectory_distinguished_name</i>
Key Required	Yes
Example	Server Context = .install.novell

Add Replica = *string*

Purpose	Controls whether a replica is added to the server. This applies only if the server is not one of the first three servers added to an eDirectory tree. (By default, the first three servers receive replicas.)
Default	(none)
Values	True, False
Key Required	No
Example	Add Replica = True

Upgrade User Conflict Action = *string*

Purpose	Determines what action is to be taken during the upgrade of a NetWare 3.1x server when objects of the same name are found during the conversion of the bindery to eDirectory.
Default	(none)
Values	Delete, Merge, Rename
Key Required	No, unless it is an upgrade from NetWare 3.1x.
Example	Upgrade User Conflict Action = Merge

Admin Login Name = *string*

Purpose	Specifies the name for the server administrator.
Default	(none)
Values	<i>text</i>
Key Required	Yes
Example	Admin Login Name = Admin

Admin Context = *string*

Purpose	Identifies the eDirectory context that the server administrator is to be installed into.
Default	(none)
Values	<i>eDirectory_distinguished_name</i>
Key Required	Yes
Example	Admin Context = .install.novell

Admin Language = *integer*

Purpose	Specifies the language of the server administrator. User objects created by the server administrator are assigned this language.
Default	4 (English)
Values	1 to 100
Key Required	Yes
Example	Admin Language = 4

Admin Password = *string*

Purpose	Specifies the password for the server administrator. For security purposes, this password is removed from the response file after eDirectory is installed.
Default	(none)

Values	<i>text</i>
Key Required	Yes
Example	Admin Password = Novell

Display Summary = *string*

Purpose	Controls whether the eDirectory Summary screen is displayed.
Default	True
Values	True, False
Key Required	Yes
Example	Display Summary = True

[NWI:License] Section

This section specifies information about NetWare server licensing.

Prompt = *string*

Purpose	Controls whether the license screen is displayed.
Default	True
Values	True, False
Key Required	Yes
Example	Prompt = True

Display License Agreement = *string*

Purpose	Controls whether the license agreement screen at the beginning of the server install is displayed.
Default	True
Values	True, False
Key Required	Yes
Example	Display License Agreement = False

Install Licenses Later = *string*

Purpose	Controls whether licenses are installed on the server. If set to True, all remaining licensing keys are ignored. This only applies to the server license and not to the NICI foundation key.
Default	False
Values	True, False

Key Required	No
Example	Install Licenses Later = True

License File = *string*

Purpose	Identifies the directory that contains a license envelope file.
Default	(none)
Values	Existing DOS path—up to 255 characters.
Key Required	No, unless a license is to be installed.
Example	License File = c:\nwserver\

NICI Foundation Key File = *string*

Purpose	Identifies the directory that contains a region-specific cryptography module.
Default	(none)
Values	Existing DOS path—up to 255 characters.
Key Required	No
Example	NICI Foundation Key File = c:\lic\

Default License Path = *string*

Purpose	Identifies a default license path other than a:\license.
Default	(none)
Values	Existing DOS path—up to 255 characters.
Key Required	No
Example	Default License Path = c:\license

Search For Existing License = *string*

Purpose	Controls whether the licenses (such as MLA licenses) are searched for in the tree. Used in conjunction with the next key.
Default	True
Values	True, False
Key Required	Yes
Example	Search For Existing License = False

Auto Skip If License Found = *string*

Purpose	Controls whether the license that was found using the previous key is used; this is particularly useful for MLA accounts.
Default	False
Values	True, False
Key Required	Yes
Example	Auto Skip If License Found = True

[Tomcat4] Section

This section specifies information about Tomcat 4.

Prompt = *string*

Purpose	Determines whether the Tomcat installation displays error/dependency messages, or if it simply logs the error.
Default	False
Values	True, False
Key Required	No
Example	Prompt = True

[j2ee] Section

This section specifies information about the exteNd J2EE Application Server.

Prompt = *string*

Purpose	Controls whether the exteNd Application Server configuration screens are displayed.
Default	False
Values	True, False
Key Required	No
Example	Prompt = True

Admin User = *string*

Purpose	Specifies the admin user for the exteNd Application Server HTTP interface.
Default	admin
Values	<i>any valid username</i>
Key Required	No

Example	Admin User = testadmin
---------	------------------------

Admin Password = *string*

Purpose	Specifies the password for the exteNd Application Server HTTP interface. Novell recommends that you do not use your eDirectory admin user's password.
Default	admin
Values	<i>string</i>
Key Required	Yes, if silent install.
Example	Admin Password = 12345678

HTTP Port = *string*

Purpose	Specifies the exteNd Application Server HTTP port. Regardless of this value, the Application Server is integrated with Apache and works through port 80 as well.
Default	83
Values	<i>any_valid_TCP/IP_port_number</i>
Key Required	No
Example	HTTP Port = 90

Restrict Access = *string*

Purpose	Controls whether the exteNd Application Server's interface is secured by default, using the Admin User and Admin Password specified above.
Default	True
Values	True, False
Key Required	No
Example	Restrict Access = False

Hostname = *string*

Purpose	Specifies the host where the MySQL database that will be used for the AppServer Administration resides.
Default	localhost
Values	<i>any_valid_DNS_host_name</i>
Key Required	No
Example	Hostname = testserver

Port = *string*

Purpose	Specifies the TCP port number for the MySQL database.
Default	3306
Values	<i>any_valid_TCP/IP_port_number</i>
Key Required	No
Example	Port = 3307

Database User = *string*

Purpose	Identifies the user to be created in MySQL for exteNd Application Server database access.
Default	appserver
Values	<i>any_valid_MySQL_username</i>
Key Required	No
Example	Database User = mydbauser

Database Password = *string*

Purpose	Specifies the password for the user to be created in MySQL for exteNd Application Server database access.
Default	appserver
Values	<i>any_valid_MySQL_password</i>
Key Required	No
Example	Database Password = 12345678

SilverMaster Name = *string*

Purpose	Specifies the name of the database to be created in MySQL for exteNd Application Server deployment and management.
Default	SilverMaster50
Values	Any string
Key Required	No
Example	SilverMaster Name = SilverMaster

Execute SilverMasterInit = *string*

Purpose	Specifies whether SilverMaster should be executed. This results in the SilverMaster50 database being cleared out and reinitialized. You might choose to set this to False if this is the second node in an exteNd Application Server cluster or if you are simply trying to refresh your installed files.
Default	True
Values	True, False
Key Required	No
Example	Execute SilverMasterInit = False

[MySQL] Section

This section specifies information about MySQL.

Prompt = *string*

Purpose	Controls whether the MySQL Options screen is displayed.
Default	True
Values	True, False
Key Required	No
Example	Prompt = True

dataDirectory = *string*

Purpose	Specifies the location of the MySQL data directory. The volume must be an NSS volume. The directory is created if needed.
Default	<code>sys:\mysql\data</code>
Values	<i>full directory path</i>
Key Required	No
Example	dataDirectory = data:\mysql\data

rootPassword = *string*

Purpose	Specifies the password for the MySql root user.
Default	(none)
Values	<i>text</i>
Key Required	No, unless prompt = False and secureInstall = True.
Example	rootPassword = 12345678

`secureInstall = string`

Purpose	Indicates whether the MySQL installation should be secure. In a secure MySQL installation, only a local root user is created, a root password is required, and the test database is not created.
Default	True
Values	True or False
Key Required	No
Example	<code>secureInstall = True</code>

`startupServer = string`

Purpose	Controls whether <code>mysqld_safe</code> is added to <code>autoexec.ncf</code> to automatically start the MySQL server whenever the server is started.
Default	True
Values	True, False
Key Required	No
Example	<code>startupServer = True</code>

`installDatabase = string`

Purpose	Controls whether the initial MySQL database is created.
Default	True, unless grant tables already exist in the MySQL data directory.
Values	True, False
Key Required	No
Example	<code>installDatabase = True</code>

`tuneForAMP = string`

Purpose	Controls whether the MySQL configuration file and NetWare server settings are tuned for a NetWare AMP install pattern.
Default	True for NetWare AMP install pattern; otherwise, False.
Values	True, False
Key Required	No
Example	<code>tuneForAMP = True</code>

[iStorage] Section

This section specifies information about netstorage and iFolder® .

PrimaryDomain = *string*

Purpose	Specifies the IP address or DNS name of the eDirectory tree used for netstorage/XTier authentication.
Default	(IP address or DNS name of the server being installed.)
Values	<i>text</i>
Key Required	No
Example	PrimaryDomain = 123.45.67.890

PrimaryContext = *string*

Purpose	Specifies the eDirectory context to use for contextless login.
Default	(none)
Values	<i>eDirectory_context</i>
Key Required	No
Example	PrimaryContext = Sales

SecondaryDomain = *string*

Purpose	Specifies an additional domain for netstorage drive mappings.
Default	(none)
Values	<i>text</i>
Key Required	No
Example	SecondaryDomain = domainname

SecondaryContext = *string*

Purpose	Specifies an additional context for netstorage drive mappings.
Default	(none)
Values	<i>text</i>
Key Required	No
Example	SecondaryContext = Marketing

TertiaryDomain = *string*

Purpose	Specifies an additional domain for netstorage drive mappings.
Default	(none)
Values	<i>text</i>

Key Required	No
Example	TertiaryDomain = domainname

TertiaryContext = *string*

Purpose	Specifies an additional context for netstorage drive mappings.
Default	(none)
Values	text
Key Required	No
Example	TertiaryContext = Finance

ProxyHostname = *string*

Purpose	Controls where the passphrase form of the iFolder component submits to.
Default	(none)
Values	text
Key Required	No
Example	ProxyHostname = YourHostName

ProxyHostport = *integer*

Purpose	Specifies the port where the passphrase form of the iFolder component submits to.
Default	(none)
Values	integer
Key Required	No
Example	ProxyHostport = 80

iFolderIPAddress = *integer_or_string*

Purpose	Specifies the DNS name or IP address of the iFolder server.
Default	(IP address or DNS name of the server being installed.)
Values	integer_or_text
Key Required	No
Example	iFolderIPAddress = 123.45.67.890

iFolderPortNumber = *integer*

Purpose	Specifies the port that the iFolder server should listen on.
---------	--

Default	80
Values	<i>integer</i>
Key Required	No
Example	iFolderPortNumber = 80

[NWI:Add to Startup] Section

This section specifies SET commands to be added to the server's NetWare registry file.

NOTE: Starting in NetWare 6, the preferred location for SET parameters is the NetWare registry. In earlier versions of NetWare, these commands were added to the server's `startup.ncf` file.

Prepend Line *n* = *console_command*

Purpose	Adds the line to the NetWare registry. If multiple lines are listed, <i>n</i> should increment sequentially.
Default	(none)
Values	<i>console_command</i>
Key Required	No
Example	Prepend Line 1 = SET IGNORE DISK GEOMETRY=ON

Append Line *n* = *console_command*

Purpose	Adds the line to the NetWare registry. If multiple lines are listed, <i>n</i> should increment sequentially.
Default	(none)
Values	<i>console_command</i>
Key Required	No
Example	Append Line 1 = LOAD NFS.NAM

[NWI:Append To Autoexec.ncf] Section

This section specifies commands to be added to middle of the server's `autoexec.ncf` file.

Line *n* = *console_command*

Purpose	Adds the line to the middle of the <code>autoexec.ncf</code> file, after core operating system commands and before the products. If multiple lines are listed, <i>n</i> should increment sequentially.
Default	(none)
Values	<i>console_command</i>
Key Required	No

Example	Line 1 = LOAD MONITOR
---------	-----------------------

[NWI End:Append To Autoexec.ncf]

This section specifies commands to be added to the end of the server's `autoexec.ncf` file.

Line *n* = *console_command*

Purpose	Adds the line to the end of the <code>autoexec.ncf</code> file, after the products. If multiple lines are listed, <i>n</i> should increment sequentially.
Default	(none)
Values	<i>console_command</i>
Key Required	No
Example	Line 1 = confile.ncf

[NWI:Comment Out Line In Autoexec.ncf]

This section specifies commands to be commented out in the server's `autoexec.ncf` file.

Line *n* = *console_command*

Purpose	Looks in the <code>autoexec.ncf</code> file for the line that contains the specified string and comments it out by inserting a semicolon at the beginning of the line.
Default	(none)
Values	<i>string</i>
Key Required	No
Example	Line 1 = ?startx

[NWI:Use NCF Settings] Section

This section specifies whether to use the server name in the response file during an upgrade.

Override NCF = *string*

Purpose	During an upgrade, if set to True, the server name is specified in the response file instead of the <code>autoexec.ncf</code> file.
Default	False
Values	True, False
Key Required	No
Example	Override NCF = True

[NWI:Video]

This section redirects the X Windows/Java GUI output or environment to an IP port.

Remote IP = *IP_address:port*

Purpose	Redirects X Windows/Java GUI output to the specified IP port.
Default	(None)
Values	Valid IP address and port
Key Required	No
Example	Remote IP=123.45.67.89:0

Remote IP ENV = *IP_address:port*

Purpose	Redirects X Windows/Java GUI environment to the specified IP port.
Default	(None)
Values	Valid IP address and port
Key Required	No
Example	Remote IP ENV = 123.45.67.89:0

[NOVELL: NOVELL_ROOT:1.0.0] Section

This section must be present to perform a completely automated or “silent” installation.

Prompt = *string*

Purpose	Controls whether the screen is displayed.
Default	True
Values	True, False
Key Required	Yes
Example	Prompt = False

allowCloseScreen = *string*

Purpose	Controls whether the final installation screen is displayed.
Default	True
Values	True, False
Key Required	No
Example	allowCloseScreen = True

allowSummary = *string*

Purpose	Controls whether the installation Summary screen is displayed.
---------	--

Default	True
Values	True, False
Key Required	Yes
Example	allowSummary = False

closeScreen = *string*

Purpose	When this parameter is set, the final installation screen is not shown.
Default	(none)
Values	NWICloseScreen
Key Required	Yes
Example	closeScreen = NWICloseScreen

Reboot = *string*

Purpose	Controls whether the server is restarted after the final screen of the installation is closed.
Default	(none)
Values	True, False
Key Required	Yes
Example	Reboot = False

silent = *string*

Purpose	Global key that controls whether the installation runs in silent mode with no user interaction. To make volume creation (nssmu.nlm) silent, set silent = True.
Default	False
Values	True, False
Key Required	Yes
Example	silent = False

[Initialization] Section

This section must be present to perform a completely automated or “silent” installation.

Install = *string*

Purpose	Indicates a silent install for a new server or factory installation. This key is not used for silent upgrades.
Default	silent

Values	silent
Key Required	Yes (for silent new server and factory installations)
Example	Install = silent

Install State = *string*

Purpose	Specifies the install state for new server installations (First) and factory/blade server installations (Second).
Default	(none)
Values	First, Second
Key Required	Yes
Example	Install State = Second

Description = *string*

Purpose	Stores a description for the response file.
Default	(none)
Values	text
Key Required	No
Example	Description = Response File for New Server Installation

DescriptionID = *string*

Purpose	Allows the response file description to be displayed in other languages.
Default	(none)
Values	ni\\rspdata\\response::UpgradeDescription
Key Required	No
Example	DescriptionID = ni\\rspdata\\response::UpgradeDescription

A.5.4 Automating the Installation of Additional Products and Services

As part of the overall NetWare installation, you can auto-install additional products and services by including a [Selected Nodes] section in the response file. Because this section of the response file is not as easy to configure as the other sections are, Novell recommends that you use the NetWare Response File Utility or the Response File Generator.

- ♦ “Minimum Information for the [Selected Nodes] Section” on page 173
- ♦ “Entries for Additional Products and Services” on page 173
- ♦ “Product Keys and Values” on page 174

- ♦ “[NW:LdapConfig] Section for LDAP Configuration” on page 177
- ♦ “[DNS_DHCP] Section for DNS/DHCP Configuration” on page 177

Minimum Information for the [Selected Nodes] Section

The following lines represent the minimum information that must be included in the [Selected Nodes] section:

```
Novell:NetWare5:1.0.0=Novell:NetWare5OS:5.0.0,Novell:Products:1.0.0,
Novell:NWUpdateGroup:1.0.0
Novell:NetWare5OS:5.0.0=Novell:DiskCarver:1.0.0,Novell:Protocols:
1.0.0,Novell:DS_Install:1.0.0,
Novell:LicensePrompt:1.0.0,Novell:NW:1.0.0,Novell:NDPS Server Files:
1.0.0
Novell:NW:1.0.0=Novell:Startup:1.0.0,Novell:SYS:1.0.0,Novell:
DriverFiles:1.0.0
Novell:Startup:1.0.0=Novell:StartupDirectory:1.0.0
Novell:SYS:1.0.0=Novell:SYSDirectory:1.0.0,Novell:ETCDirectory:1.0.0,
Novell:PROFINST_NODE:1.0.0
Novell:DriverFiles:1.0.0=Novell:LANFiles:1.0.0,Novell:SBDFiles:1.0.0
Novell:NDPS Server Files:1.0.0=Novell:NDPS System:1.0.0,Novell:NDPS Public:1.0.0
Novell:Products:1.0.0=Novell:NICInstall:1.0.0
Novell:NICInstall:1.0.0=Novell:NICIModule:1.0.0
Novell:NWUpdateGroup:1.0.0=Novell:NWUpdate:1.0.0
```

Entries for Additional Products and Services

This section lists the entries to include in the [Selected Nodes] section if you want additional products and services to be auto-installed.

Prompt = *string*

Purpose	Controls whether the Additional Products and Services screen is displayed.
Default	True
Values	True, False
Key Required	Yes
Example	Prompt = True

Patterns = *string*

Purpose	Specifies which pattern to install. This coordinates with the pattern selection screen that displays during the server install. Only one pattern from the available list can be selected. If you select the Customized NetWare Server pattern, you should also select products in the Products key described below.
Default	None
Values	(Pattern chosen from list of available patterns)
Key Required	No
Example	Patterns = CustomNetWare

Products = *strings_separated_by_commas*

Purpose	Specifies the additional products and services to be installed on the server. This key is necessary only if you selected CustomNetWare using the previous key. To install multiple products on a server, make sure that the Products key has multiple values, separated by commas as shown in the example.
Default	(None - but if no products are specified, basic NetWare is installed)
Values	Novell Certificate Server, 6pkLdap, Imonitor, Apache2 Admin Server, Tomcat4, Apache2 Webserver, Portal, SMS, ConsoleOneProducts, NDPS, FTP Server, NetWare Web Search, ipWanMan, NWNMAS, DNSDHCP, iFolder, NWEMBOX, NWSNMP, MySQL, j2ee, uddi, audit, RSyncSrv, iSCSI Module, Beans, iStorage, NSN, Perl, PHP, OpenSSH, Wan Connectivity, eGuide, iManager2.5 Product, Virtual Office
Key Required	No
Example	Products = Novell Certificate Server, ipWanMan

Product Keys and Values

In addition to identifying the product in the Products key, each product has its own keys and values for the [Selected Nodes] section. These keys and values are listed below and must be entered in *Key=value* format. It is easier to reuse a response file from a previous installation rather than attempt to type these keys and values into the file. If you do not specify them exactly as shown, the NetWare Installation fails abruptly with no information to help you troubleshoot the problem.

IMPORTANT: If you do specify any of these keys and values manually, be sure to use the proper case (upper or lower) exactly as shown.

Apache2 Admin Server

Apache2 Admin Server=AApache2,AAp2Conf,adminsrv,welcome

Apache2 Web Server and Tomcat 4 Servlet Container

Apache2 Webserver=Ap2webcf

Beans for Novell Services

Beans=BEANS_ZIP

Branch Office - Rsync Server

RSyncSrv=RSyncSrvInstall
RSyncSrvInstall=RSyncSrvZip

ConsoleOne

ConsoleOneProducts=ConsoleOne,Reporting Snapin
ConsoleOne=c1_core,c1_win32,c1_nw.zipReporting Snapin=c1_rpt

eDirectory Management Utilities Toolbox

NWEMBOX=embox_DFG

eDirectory SNMP Subagent

NWSNMP=SNMP_SYSTEM_DFG,SNMP_ETC_DFG

eGuide

eGuide=eGuideFiles

exteNd Application Server

j2ee=exteNd Application Server zip file,exteNd Application Server NetWare Overlay,exteNd Application Server IP address Management zip file

iPrint

NDPS=NDPS Server Files,NDPSResourceFiles
NDPS Server Files=Xfer IPP Login Files,IPP Login Files,IPrint Files,Gateway Files
NDPSResourceFiles=NDPS Banner,NDPS Font,NDPS Prndef,NDPSPrndrv
NDPSPrndrv=NDPSPrndrv-HP,NDPSPrndrv-Xerox,NDPSPrndrv-Kyocera,
NDPSPrndrv-Lexmark,NDPSPrndrv-IBM,NDPSPrndrv-Oki,NDPSPrndrv-QMS
NDPSPrndrv-HP=HPDrivers
NDPSPrndrv-Xerox=XeroxDrivers
NDPSPrndrv-Kyocera=KyoceraDrivers
NDPSPrndrv-Lexmark=LexmarkDrivers
NDPSPrndrv-IBM=IBMDrivers
NDPSPrndrv-Oki=OkiDrivers
NDPSPrndrv-QMS=QMSDrivers

MySQL

MySQL=MySQL install module
MySQL install module=Product zip file,Configuration zip file,
JDBC Driver zip file,Manage zip file

NDS iMonitor Services

Imonitor=imonitor_DFG

NetWare FTP Server

FTP Server=ftpfilezip

NetWare Remote Manager (NRM)

Portal=portalzip,httpstkzip

NetWare Web Search Server

NetWare Web Search=NSearch1,Templates,Sample Templates

Novell Audit Starter Pack

audit=Nsure auditing zip file,Nsure auditing lsc files

Novell Certificate Server

Novell Certificate Server=CertServ System Files,CertServ Public Files

Novell DNS/DHCP Services

DNSDHCP=dnipFiles

Novell iFolder Storage Services

iFolder=iFolder install module
iFolder install module=iFolder zip file,ifolder_en

Novell iManager

iManager2.7 Product = EXTEND_ZIP_FILE, EXTEND_CONF_FILES, EXTEND_PACKAGE_FILES,
EXTEND_XAR_FILE

Novell Modular Authentication Service (NMAS)

NWNMAS=NMAS Server System Files,NMAS Methods

Novell netstorage

iStorage=components

Novell UDDI Server

uddi=uddiFiles

Novell Virtual Office Framework

Virtual Office=Virtual Office Packages

NSN

NSN=NSN install module,UCS install module
NSN install module=NSN Product zip file
UCS install module=UCS Product zip file

OpenSSH

OpenSSH=SSH-Config,SSH-Core,SSH-Docs

Perl

Perl=Perl install module
Perl install module=Perl Product zip file

PHP

PHP=PHP install module
PHP install module=PHP Product zip file

Storage Management Services (SMS)

`SMS=SMSSystemFiles`

Tomcat4 Admin Instance

`Tomcat4=Tomcat zip file,examples zip file,Tomcat admin configuration, Novell
Tomcat Startup Scripts`

WAN Connectivity

`Wan Connectivity=WanConnectZip,UpgradeFrom`

WAN Traffic Manager Services

`ipWanMan=dfgWanManSysSystem`

[NWI:LdapConfig] Section for LDAP Configuration

If you specified LDAP Services for Novell eDirectory as a product to be added to the server, you must include an `[NWI:LdapConfig]` section in the response file in addition to the product-related keys and values listed above.

Prompt = *string*

Purpose	Controls whether the LDAP Configuration screen is displayed.
Default	True
Values	True, False
Key Required	Yes
Example	Prompt = True

ClearText = *string*

Purpose	Specifies whether to accept LDAP bind requests that include clear-text passwords on non-SSL/TLS connection (Require TLS for Simple Bind with Password option).
Default	False
Values	True, False
Key Required	Yes
Example	ClearText=False

[DNS_DHCP] Section for DNS/DHCP Configuration

If you specified Novell DNS/DHCP Services as a product to be added to the server, you must include a `[DNS_DHCP]` section in the response file in addition to the product-related keys and values listed above.

Prompt = *string*

Purpose	Controls whether the DNS/DHCP configuration screen is displayed.
Default	None
Values	True, False
Key Required	Yes
Example	Prompt = False

ExtendDNIPSchema = *string*

Purpose	Controls whether the schema is extended for DNS/DHCP Services. This should be set to True.
Default	(none)
Values	True, False
Key Required	Yes
Example	ExtendDNIPSchema = True

GroupNDSContext = *string*

Purpose	Identifies the eDirectory context that the Group Object is to be installed into.
Default	(none)
Values	eDirectory_distinguished_name
Key Required	Yes
Example	GroupNDSContext = O=install

LocatorNDSContext = *string*

Purpose	Identifies the eDirectory context that the Locator Object is to be installed into.
Default	(none)
Values	<i>eDirectory_distinguished_name</i>
Key Required	Yes
Example	LocatorNDSContext = O=install

RootSrvrNDSContext = *string*

Purpose	Identifies the eDirectory context that the RootSrvr Zone is to be installed into.
Default	(none)
Values	<i>eDirectory_distinguished_name</i>

Key Required	Yes
Example	RootSvrNDSText = O=install

TreeName = *string*

Purpose	Specifies the eDirectory tree that DNS/DHCP Services are to be installed into.
Default	(none)
Values	<i>text</i>
Key Required	Yes
Example	TreeName = Novell

UserName = *string*

Purpose	Identifies the Admin name and eDirectory context; this should correspond with the Admin Login Name and Admin Context identified in the NWI:NDS section of the response file. Note the case of the characters in the string.
Default	(none)
Values	<i>eDirectory_distinguished_name</i>
Key Required	Yes
Example	UserName=.CN=admin.O=install

A.5.5 Calling an Install Script During a Response File Installation

In NetWare, install scripts can be used to customize the NetWare installation program by copying additional files to the server or launching NLM programs (for example, those that install other products). Install scripts are also supported by the NWCONFIG utility.

There are two places in the NetWare installation program where you can use install scripts:

- ♦ At the end of the preliminary file copy (just prior to the launching of the graphical portion of the install). An install script executed here can be used for copying files from the DOS partition to the sys: volume.
- ♦ At the end of the NetWare installation. The script is called immediately after you answer OK or No on the closing screen and before the install cleanup process. This is useful if you want to manage files and launch NLM programs as part of the NetWare installation.

[NWI:Install Script] Section

If you want to call an install script during a response file installation, add an [NWI:Install Script] section to the response file with the following keys and values.

Script Location = *string*

Purpose	Identifies the filename and path of an install script that is executed at the end of the preliminary file copy (prior to the launching of the graphical portion of the install). Using the ? wildcard in the extension of the filename suppresses an error if the specified file does not exist.
Default	None
Values	<i>Existing_DOS_path</i> (up to 255 characters)
Key Required	No
Example	Script Location = c:\nwupdate\precopy.ic?

Close Script = *string*

Purpose	Identifies the filename and path of an install script that is executed when the final screen of the NetWare server installation is closed, just prior to some housekeeping that is done by the Close Screen routine.
Default	None
Values	<i>Existing_DOS_path</i> (up to 255 characters)
Key Required	No
Example	Script Location = sys:\other.ics

Install Command Line Options

B

You can use command line options when initiating the NetWare installation executable (`install.exe`) from either DOS or a network drive. (See [Section 4.2, “Starting the Installation Program,”](#) on page 38.)

/IIPX decimal_number

Purpose	Allows a specific internal net address to be used for the server being installed.
Values	1 to 99999999
Example	<code>install /IIPX 38483933</code>

/SERVER_ID hexadecimal_number

Purpose	Allows a specific server ID to be used for the server being installed.
Values	1 to FFFFFFFF
Example	<code>install /SERVER_ID 1357ABCD</code>

/SERVER_LOG = string

Purpose	Designates where an installation log file will be created.
Values	Existing DOS path up to 255 characters
Example	<code>install /SERVER_LOG=c:\tmp\error.log</code>

Upgrading to NetWare 6.5 SP6

C

Although Novell® NetWare® no longer supports in-place or remote upgrades, this information is being included so that customers with NetWare 5.1 or 6.0 servers can use the NetWare 6.5 SP6 overlay CDs to perform an in-place or remote upgrade to NetWare 6.5 SP6 as part of a transition to NetWare 6.5 SP8 (OES 2 SP1 NetWare).

For instructions on how to upgrade your server by applying the latest NetWare Support Pack, see [Chapter 3, “Upgrading to OES 2 SP1 NetWare,” on page 33](#).

IMPORTANT: To complete the upgrade procedures outlined in this section, you need the NetWare 6.5 SP6 overlay CDs. The .iso image files for these CDs can be downloaded from the [Novell Downloads Web site](http://www.novell.com/download) (<http://www.novell.com/download>). Follow the instructions included with the download to create CDs from the image files.

Upgrading a server to OES NetWare by using the overlay CD method includes the following tasks:

- ♦ “Meeting System Requirements” on page 183
- ♦ “Obtaining the NetWare Installation CDs” on page 184
- ♦ “Preparing the Network with Deployment Manager” on page 184
- ♦ “Preparing the Server” on page 185
- ♦ “Starting an Upgrade” on page 187
- ♦ “Completing the Server Upgrade” on page 193

IMPORTANT: Upgrades to OES NetWare are performed on a running NetWare server. The down-server upgrade method is no longer supported. See [Section C.7, “Down-Server Upgrades,” on page 193](#) for more information.

C.1 Meeting System Requirements

To upgrade to OES NetWare, your system must meet the minimum software and hardware requirements listed below.

- ♦ [Section C.1.1, “Software Requirements,” on page 183](#)
- ♦ [Section C.1.2, “Hardware Requirements,” on page 184](#)

C.1.1 Software Requirements

❑ The server to be upgraded must be running one of the following versions of NetWare:

- ♦ NetWare 5.1 with Support Pack 8 or later

Upgrading to OES NetWare from NetWare 5.1 Support Pack 6 and eDirectory™ version 8.5 is not supported. The minimum eDirectory level required to upgrade to OES NetWare is eDirectory version 8.6 or later.

Upgrading to OES NetWare from NetWare 5.1 running NDS® version 7 or later *is* supported, if Deployment Manager is first run to prepare the network.

- ♦ NetWare 6.0 with Support Pack 5 or later
 - ♦ NetWare 6.5 (FCS, Support Pack 1.1, Support Pack 2, or Support Pack 3)
 - ♦ OES NetWare (NetWare 6.5 with Support Pack 3, Support Pack 4, or Support Pack 5)
- ☐ The server to be upgraded cannot be in a tree that contains NetWare 4.10 servers. All servers in the tree must be NetWare 4.11 or later.
 - ☐ (Optional) If you plan to run the upgrade program from CD, you need the drivers required to access the CDs.
 - ☐ (Optional) If you plan to upgrade by using the NetWare installation files copied to another NetWare server running IP, you need the IP Server Connection Utility.

C.1.2 Hardware Requirements

The server to be upgraded must meet the following hardware requirements:

- ☐ A server-class PC with a Pentium II or AMD K7 processor
- ☐ 512 MB of RAM (Minimum)
- ☐ 1 GB of RAM (Recommended)
- ☐ A Super VGA display adapter
- ☐ A DOS partition with at least 200 MB of available space
- ☐ 2 GB of available disk space outside the DOS partition for volume SYS
- ☐ One network board
- ☐ A CD drive
- ☐ A USB or PS/2 mouse (recommended but not required)

C.2 Obtaining the NetWare Installation CDs

The upgrade procedures described here assume you are upgrading to OES NetWare. The process is the same as upgrading to NetWare 6.5 Support Pack 6 and uses the same CD set.

To obtain the SP6 overlay Operating System and Products CDs, you must download the CD images and burn the `.iso` files to blank CD media. You can use any third-party CD burning software to create the installation CDs for use when upgrading to OES NetWare.

For instructions, see “[Getting and Preparing OES 2 Software](#)” in the *Novell OES SP2 Planning and Implementation Guide*.

C.3 Preparing the Network with Deployment Manager

Next, you should prepare the network for the OES NetWare server upgrade by completing the appropriate tasks in the Novell Deployment Manager utility.

For instructions, see [Section 2.5, “Using Deployment Manager,” on page 26](#).

C.4 Preparing the Server

To prepare your existing server for the NetWare operating system, complete the following tasks:

- ♦ [Section C.4.1, “Understand the Upgrade Process,” on page 185](#)
- ♦ [Section C.4.2, “Back Up the NetWare Server Files,” on page 185](#)
- ♦ [Section C.4.3, “Log Out Users Prior to Upgrading,” on page 185](#)
- ♦ [Section C.4.4, “Prepare Application Files Prior to Upgrading,” on page 185](#)
- ♦ [Section C.4.5, “Verify a Valid DOS Partition,” on page 186](#)
- ♦ [Section C.4.6, “Locate NetWare License Files,” on page 186](#)
- ♦ [Section C.4.7, “Verify Your Rights,” on page 186](#)

C.4.1 Understand the Upgrade Process

When you run the upgrade program, the server is upgraded to the latest version of OES NetWare and the following tasks are automatically performed:

- ♦ Device drivers and LAN drivers for the NetWare operating system are loaded. Outdated drivers are matched with and replaced by new drivers included with OES NetWare.
- ♦ eDirectory is upgraded to version 8.7.3.
- ♦ OES NetWare information is added to `autoexec.ncf` and `startup.ncf`.
- ♦ The OES NetWare files are copied to the server.

IMPORTANT: If you are prompted to overwrite newer files patches or more recent Support Packs, Novell recommends overwriting newer files when performing major OS upgrades.

C.4.2 Back Up the NetWare Server Files

Make at least one backup of your NetWare server files, including files DOS partition. Do not attempt an upgrade without a backup.

C.4.3 Log Out Users Prior to Upgrading

You should log all users off the server before upgrading it.

C.4.4 Prepare Application Files Prior to Upgrading

Some applications require that you perform certain actions prior to upgrading.

Prepare Servers Running ZENworks for Server 2 (Conditional)

If the server is running ZENworks® for Servers 2, you must install ZENworks for Servers 3 prior to upgrading the server to OES NetWare.

Turn Off Applications and Services

Any applications, products, or services (virus scan software, backup software, etc.) running on the server to be upgraded should be shut down before beginning the upgrade procedure.

C.4.5 Verify a Valid DOS Partition

Your NetWare server uses the DOS partition to start the computer and load NetWare. Many of the existing NetWare startup files will be replaced with new OES NetWare files. In addition, the DOS partition must exceed the minimum amount of available space to accommodate new OES NetWare files.

If the DOS partition does not have enough available space, you cannot upgrade the server. You must create a new DOS partition and install a new server. See “[Creating and Formatting a Boot Partition](#)” on page 39.

TIP: If your computer does not meet the minimum requirements, you might try using the NetWare Migration Wizard to migrate data to another computer. For more information, see the [Novell Server Consolidation and Migration Toolkit documentation \(http://www.novell.com/documentation/scmt\)](http://www.novell.com/documentation/scmt).

C.4.6 Locate NetWare License Files

If you are upgrading to OES NetWare from a version of NetWare earlier than NetWare 6.5, you must purchase new license files from your Novell Authorized Reseller. Make sure the license files are in a location where they can be accessed by the NetWare Install program, such as on a diskette or on the server’s DOS partition. The NetWare Install program automatically updates the licenses.

If you are upgrading to OES NetWare from any version of NetWare 6.5 (from FCS to SP5), you can continue to use your current license files or install a new license if you have increased the number of users on your network. The NetWare Install program detects the installed license during the upgrade and prompts you to either use the current license or install a new license.

C.4.7 Verify Your Rights

The rights required to upgrade a NetWare server vary depending on whether you use the Admin user account created during the NetWare installation or set up different user accounts as subcontainer administrators.

- ♦ “[Rights Required for Upgrading NetWare Servers](#)” on page 186
- ♦ “[Rights Required for Subcontainer Administrators](#)” on page 187

Rights Required for Upgrading NetWare Servers

To upgrade the first NetWare 6.0 or earlier server in an eDirectory tree to OES NetWare, the user must have the Supervisor right at the [Root] of the tree. The Admin user that is created during the OES NetWare Install program has full rights to the root of the tree. Using the Admin account allows the installer to extend the eDirectory schema for OES NetWare as necessary.

If you are upgrading the first NetWare server in an existing NDS/eDirectory tree to OES NetWare, be sure to run the Deployment Manager first to prepare the tree so it is compatible with the version of eDirectory that comes with OES NetWare. This requires access to a server with a Read/Write replica of the Root partition.

Rights Required for Subcontainer Administrators

For security reasons, you might want to create one or more subcontainer administrators with sufficient rights to install or upgrade additional OES NetWare servers, without granting them full rights to the entire tree. A subcontainer administrator needs the following rights to install or upgrade a NetWare server in the tree:

- ☐ Supervisor right to the container where the server will be installed
- ☐ Read right to the Security container object for the eDirectory tree
- ☐ Read right to the NDSPKI:Private Key attribute on the Organizational CA object, which is located in the Security container
- ☐ Supervisor right to the W0 object located inside the KAP object in the Security container

These rights are typically granted by placing all administrative users in a Group or Role, and then assigning the above rights to the Group or Role.

Some of the products that can be selected to install along with OES NetWare require schema extensions of their own. Currently, only an administrator with rights at [Root] can extend the schema of an eDirectory tree; a subcontainer administrator does not have sufficient rights. One way to work around this is to have a root administrator install an OES NetWare server with all products selected. This would take care of extending the schema for every possible server configuration. Subcontainer administrators can then install or upgrade subsequent OES NetWare servers without worrying about schema extensions.

An easier method for extending the schema for OES products and services is to run the Schema Update task in Deployment Manager. This task extends the schema for the OES products you select for both the NetWare and Linux platforms.

By default, the first three servers installed in an eDirectory partition automatically receive a replica of the partition. To install a server into a partition that does not already contain three replica servers, the user must have either Supervisor rights at the [Root] of the tree or administrative rights to the container in which the server holding the partition resides.

C.5 Starting an Upgrade

The following sections explain how to start in-place and remote upgrades.

- ◆ [Section C.5.1, “In-Place Upgrades,” on page 188](#)
- ◆ [Section C.5.2, “Remote Upgrades,” on page 188](#)
- ◆ [Section C.5.3, “Accepting the License Agreements,” on page 190](#)
- ◆ [Section C.5.4, “Health Check Summary,” on page 190](#)
- ◆ [Section C.5.5, “Back Up Server Files,” on page 190](#)
- ◆ [Section C.5.6, “Installing Additional Components,” on page 191](#)
- ◆ [Section C.5.7, “eDirectory Summary,” on page 192](#)
- ◆ [Section C.5.8, “Selecting the Login Method,” on page 192](#)

C.5.1 In-Place Upgrades

When you perform an in-place upgrade to OES NetWare, both the operating system and eDirectory are upgraded. In addition, only the NetWare products or components that are currently installed are upgraded. Other Novell products that you might have purchased or installed separately (for example, GroupWise® or ZENworks) are not upgraded.

Additionally, the Enterprise server is migrated to the Apache 2 Web server when you upgrade to OES NetWare. During the upgrade, the existence of the Enterprise server is verified, and if it exists, information in the Enterprise server's config files is migrated to the Apache 2 server's config files. After the Apache 2 Web server is installed, the Enterprise server is automatically removed.

IMPORTANT: When upgrading a NetWare 5.1 or 6.0 server with the Novonyx Web Server to OES NetWare, the document root for the Novonyx Web Server is preserved and not updated to the Apache 2 Web Server document root. Some NetWare 6.5 Web services might not work correctly. To resolve this, review and edit the Apache configuration file, `sys:\apache2\conf\httpd.conf`.

If you are performing an upgrade, several components are already selected. These are the components currently installed on the server. Leaving the installed components checked reinstalls the products. Unchecking an installed component does not uninstall the product.

TIP: If you attempt to install a new server into your tree at the same time you upgrade another server in the tree to OES NetWare, you might have difficulty logging in to the server being upgraded until the other server's installation is complete.

To begin an upgrade to OES NetWare:

- 1 Insert the *NetWare 6.5 SP6 CD 1 (Operating System)* and if it does not auto-mount as a NetWare volume, do one of the following:
 - ♦ On a NetWare 6.5 server, enter `LOAD CDDVD.NSS` at the system console.
 - ♦ On a NetWare 6.0 server, enter `LOAD CD9660.NSS` at the system console.
 - ♦ On a NetWare 5 server, enter `LOAD CDROM.NLM` at the system console.

If the CD still does not mount, reboot the server.

- 2 From the server GUI console, click *Novell* and select *Install*.
- 3 In the Installed Products page, select *Add*.
- 4 When the Source Path page appears, browse to the location of your OES NetWare software.
- 5 Select the `product.ni` file and click *OK*.
- 6 Verify that the Source Path window has the correct path filled in and click *OK*.
- 7 Proceed to [“Accepting the License Agreements” on page 190](#).

C.5.2 Remote Upgrades

One of the features in NetWare is the ability to remotely upgrade any servers in your network. The process is a simple one that can be accomplished in two different ways:

TIP: When you run a remote upgrade, if the source files are located on a remote server, that server must contain a DS replica in order for the server-to-server file copy to run efficiently. If a replica does not exist on the source server, the file copy might revert to a workstation copy, which can be significantly slower over a WAN link.

- ♦ “Remote Upgrade from iManager” on page 189
- ♦ “Remote Upgrade from Novell Deployment Manager” on page 190

Remote Upgrade from iManager

Novell iManager 2.6 must be installed and configured in order for remote upgrades to successfully complete using this utility. For information on installation and configuration of iManager, see the *Novell iManager 2.5 Installation Guide*. After iManager is installed and configured, complete the following tasks:

NOTE: Performing the remote upgrade from a staging server that contains the OES NetWare installation files is significantly faster than launching from the NetWare 6.5 CD located on the workstation.

- 1 Click the *Install and Upgrade* link that displays on the left side of the iManager main page.
- 2 Click the *Upgrade to NetWare 6.5* link.
- 3 From the page on the right, click the *Upgrade a Server Remotely* link.
- 4 Click *Browse* and browse to the root of *NetWare 6.5 SP6 CD 1 (Operating System)* or the OES NetWare installation files that have been copied to a network server.

The path selected should include *nw65os*. The OES NetWare Install program expects a mapped drive and does not support UNC paths.

If you are not prompted for your source media, it is because you have run an upgrade from Deployment Manager in the past and it will launch the upgrade from that same source. If you do not want to use this previous location, delete the file `\program files\common files\novell\ni\data\browserlaunch.rsp`.
- 5 Click *OK*.
- 6 Continue with “Accepting the License Agreements” on page 190.

After the initial reboot during a remote upgrade, a login screen might display requiring you to log in to the server being upgraded. If this occurs, provide the login information, click *Details*, type the IP address of the server being upgraded, then click *OK*.

If Installation/Upgrade tasks fail to run from iManager, you might need to change your security settings.

- 1 In Internet Explorer, click *Tools > Internet Options*.
- 2 Click *Security > Custom Level*.
- 3 Under *Initialize and Script ActiveX Controls Not Marked as Safe*, select *Enable*.
- 4 Click *OK*.

Remote Upgrade from Novell Deployment Manager

NOTE: Performing the remote upgrade from a staging server that contains the OES NetWare Operating System files is significantly faster than launching from the NetWare 6.5 CD located on the workstation.

- 1 On a Windows 2000 or Windows XP Professional Edition workstation that has the latest Novell Client installed on it, log in to your existing network as a user with the Supervisor right. If you are prompted to log in again while running Deployment Manager, you can specify the IP address of the server by clicking Details.
- 2 Insert *NetWare 6.5 SP6 CD 1 (Operating System)* or map a drive to a server containing the OES NetWare installation files.
- 3 Start the Deployment Manager utility (`nwdeploy.exe` or `nwdeploynobrowser.exe`) located at the root of the CD or NetWare installation files.
- 4 Select *Upgrade to NetWare 6.5* in the left navigation bar of Deployment Manager.
- 5 In the right frame of the browser window, click the *Upgrade a Server Remotely* link.
- 6 Continue with [“Accepting the License Agreements” on page 190](#).

C.5.3 Accepting the License Agreements

For an upgrade, click *I Accept* for both license agreements, then continue with [“Health Check Summary” on page 190](#).

Accepting both license agreements means that you have read and agreed to the terms and conditions contained in the license agreements.

C.5.4 Health Check Summary

NetWare performs a health check on your server to determine if an upgrade can proceed without problems. A summary of the checks that were run is displayed including a Success, Warning, or Failure state for each check that was run.

If the health check completes without any Warning or Failure states, the health check summary page does not display. If that is the case, proceed to [“Back Up Server Files” on page 190](#).

A Success or Warning state allows the upgrade to continue. A Failure state stops the upgrade until the problem is resolved.

- 1 To view the detailed health check log, click *View Log*.
- 2 Click *Next*, then continue with [“Back Up Server Files” on page 190](#).

C.5.5 Back Up Server Files

This page allows you to specify whether to back up your server files. It also lets you select whether to automatically reboot the server after the file copy is complete and gives you the option of a Default or Manual installation.

- 1 Select *Yes* or *No* depending on whether you want to back up the server files.
- 2 If you selected *Yes*, specify the location for the backup files.

IMPORTANT: Make sure that the drive you specify as the location for the backup is a valid drive on the server.

3 If you want the server to automatically reboot after the file copy, click *Yes*. Otherwise, click *No*.

4 Select either a Default or Manual upgrade by clicking the radio button next to the desired choice.

The Default upgrade automatically detects drivers and upgrades the server to NetWare 6.5 with default settings.

The Manual upgrade lets you manually configure your drivers and the default settings used in the Default upgrade.

5 Click *Next*, then continue with “Installing Additional Components” on page 191.

C.5.6 Installing Additional Components

After the file copy is complete, the Components page displays and you can choose which additional NetWare components to install. To see a description of a component, place the cursor over the component name.

NOTE: Because you are performing an upgrade, several components are already selected. These are the components currently installed on the server. Leaving the installed components selected reinstalls the products. Deselecting an installed component does not uninstall the product.

To select additional components to install:

1 Select the components you want to install, then click *Next*. (Default selections can be deselected if desired.)

After you select the components that you want to install from the Components page, a Summary screen appears, displaying the names of the selected products and the disk space (in MB) required to install them.

If you want to change your product selection, click *Back* and make the necessary changes. After verifying the product names and space requirements, click *Copy Files*.

2 (Conditional, if installing from CD) When prompted, remove *NetWare 6.5 SP6 CD 1 (Operating System)*, insert *NetWare 6.5 SP6 CD 2 (Products)*, then click *OK*. The system proceeds to copy files for a few minutes, and then reboots.

If you selected Manual during **Step 4 on page 191**, your device drivers are detected and you are presented with a screen or screens where you can modify these settings.

IMPORTANT: The iManager installation might take up to 15 minutes to complete. During this installation, the page does not change.

3 If you see a message stating that there is a file conflict, select the file overwrite option that you prefer and click *OK*.

If you do not want to modify the settings:

- ♦ Select *Continue*.
- ♦ Press *Enter*.

4 If you want to modify the settings:

1. Select *Modify* and press *Enter*.

2. Make any desired changes.

3. Select *Continue* and press Enter.

If you selected Default during **Step 4 on page 191**, the system continues to copy files after the reboot.

IMPORTANT: If you are performing a remote upgrade and you are unable to reconnect to the server after it reboots, you can complete the upgrade locally by entering `FINISHUP.NCF` at the server console.

When this post-reboot file copy completes, a GUI screen appears and you are prompted to log in to eDirectory.

5 Type your name and password in the fields provided.

6 Click *OK*, then continue with **“eDirectory Summary” on page 192**.

C.5.7 eDirectory Summary

The eDirectory Summary page is now displayed.

1 Verify that the information on the eDirectory Summary page is accurate.

2 Record the Admin password and any other relevant information before proceeding.

3 Click *Next*, then continue with **“Selecting the Login Method” on page 192**.

C.5.8 Selecting the Login Method

NMAS™ server components are installed automatically when you run the NetWare 6.5 installation program. You need to select the login methods you want to install.

Select the login methods that you want to install into eDirectory by selecting the appropriate methods on the Novell Modular Authentication Service page. When you select a login method, a description of the component appears in the Description box. For more information on login methods, see **“Managing Login and Post-Login Methods and Sequences”** in the *Novell Modular Authentication Services 3.3.1 Administration Guide*.

The NDS login and Challenge-Response methods are installed by default.

1 On the Novell Modular Authentication Service page, select the login methods you want to use from the options provided.

Select *Select All* if you want to install all the login methods into eDirectory. Select *Clear All* if you want to clear all selections (except the two default methods).

2 Click *Next*, then continue with **“Completing the Server Upgrade” on page 193**.

IMPORTANT: The NMAS client software must be installed on each client workstation where you want to use the NMAS login methods. The NMAS client software is included with the Novell Client software.

C.6 Completing the Server Upgrade

After the upgrade is finished, remove *NetWare 6.5 SP6 CD 2 (Products)* and click *Yes* to restart the server.

If you selected to load the server on reboot, the NetWare server software automatically loads when the computer reboots.

If you selected to not load the server on reboot, you can load it manually. To load the server manually, reboot the computer by clicking *Yes*. When the computer reboots, change to the startup directory containing the NetWare server files (`c:\nwserver`) and enter `SERVER`.

If you upgraded from a NetWare 5.1 server with NSS volumes, you must complete the following procedure to update the NSS volumes.

NOTE: For more detailed information, see “[Upgrading NetWare 5.1 NSS Volumes and NetWare Traditional Volumes to NSS Volumes](#)” in the *OES 2 SP1: NSS File System Administration Guide*.

- 1 When prompted at the end of the upgrade, reboot the computer.
- 2 Make sure that all processes relating to the OES NetWare upgrade have completed.
- 3 At the server console, enter the following command:

```
NSS /ZLSSVOLUMEUPGRADE=ALL
```

The NSS volumes can now be mounted on the OES NetWare server.

C.7 Down-Server Upgrades

Upgrades to OES NetWare are performed on a running server from the server GUI console. The down-server upgrade of NetWare 4.2 servers is no longer supported.

In certain situations, customers can work with Novell Support staff to complete a down-server upgrade. For example, this might be necessary if:

- ♦ An in-place or remote upgrade on a running server fails at some point after the [Health Check Summary](#) step completes.
- ♦ After the failure, the upgrade cannot be restarted.

If you need to complete an upgrade on a downed server, contact Novell Support for assistance.

Troubleshooting Tips

D

This section gives you a list of troubleshooting suggestions that can help you resolve some of the NetWare® installation issues.

- ♦ [Section D.1, “Time Drifts in a Virtual NetWare Guest Running under VMware,” on page 195](#)
- ♦ [Section D.2, “VM Manager Doesn’t Launch on a Xen VM Host Server,” on page 195](#)

D.1 Time Drifts in a Virtual NetWare Guest Running under VMware

When you run the NetWare server as a virtualized guest under VMware, time speeds up or slows down. In addition to this, several guests are running on a single VMware host and all guests are started simultaneously. In this scenario, if time does not successfully synchronize when the virtual guest server was booted, it will never successfully synchronize.

The workaround for this issue is to set up the NetWare server to use the xntpd instead of timesync for native (physical) hardware.

- ♦ Watch the host server's utilisation and start each guest once the host's utilization is low/idling.
- ♦ Wait until the guest's time has synchronized and host server's utilization has dropped before you start the next guest.
- ♦ Do not start all guests simultaneously.

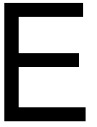
For more information on using xntpd, see the following:

- ♦ [“Configuring the Time Providers”](#) in the *OES 2: Novell NTP for NetWare Administration Guide*.
- ♦ [“Time Services”](#) in the *OES 2 SPI: Planning and Implementation Guide*.

D.2 VM Manager Doesn’t Launch on a Xen VM Host Server

If the option to launch the VM Manager for installing a NetWare guest is not available, the most likely cause is that the Xen kernel is not running on the Xen VM host server. See [The Boot Loader Program](http://www.novell.com/documentation/sles10/xen_admin/data/sec_xen_config_bootloader.html) (http://www.novell.com/documentation/sles10/xen_admin/data/sec_xen_config_bootloader.html) in the *Virtualization with Xen Guide* (http://www.novell.com/documentation/sles10/xen_admin/data/bookinfo.html).

Installing OES NetWare on VMware



Novell® Open Enterprise Server (OES) for NetWare® can be installed as a guest operating system in a VMware Virtual Machine.

This section provides information and guidelines for installers who are planning to install OES NetWare (NetWare 6.5 SP5 or higher) on VMware.

- ♦ [Section E.1, “Overview of VMware,” on page 197](#)
- ♦ [Section E.2, “Installation Guidelines for OES NetWare,” on page 198](#)

E.1 Overview of VMware

VMware is a third-party virtualization product that allows multiple servers and workstations to be hosted on a single piece of computer hardware.

With VMware, you can run multiple instances of OES NetWare on a single virtual server. In effect, you can have two or more NetWare servers running on the same hardware as if they were separate nodes on the network. The servers share hardware resources such as CPU, memory, hard drives, and network interfaces, thus maximizing resource utilization and reducing server hardware costs.

Virtualization of servers is useful in a variety of customer scenarios:

- ♦ Server consolidation and migration
- ♦ Software development and solution testing
- ♦ Rapid provisioning of preconfigured virtual machine servers
- ♦ Business continuity clustering and disaster recovery

E.1.1 VMware Product Versions

VMware offers two versions of its virtual infrastructure software that are recommended for use with NetWare:

- ♦ VMware GSX Server is designed for workgroup and departmental servers. It runs as an application on top of a host operating system.
- ♦ VMware ESX Server is designed for up to 16 processor departmental and enterprise servers. It runs natively on server hardware, without a host operating system.

VMware provides its own management tools, including a Web-based management interface and a remote service console for your virtual machine. It also offers management integration with popular systems management products, along with API and scripting capability for customized control of virtual machines.

E.1.2 Terminology

When working with VMware, it is helpful to understand the following terms used in VMware documentation and instructional materials:

- ♦ **Host:** The operating system platform that the VMware software itself runs on. For VMware GSX Server, this can be either Linux or Windows. Novell recommends the use of SUSE® Linux Enterprise Server (SLES) 9 or 10. VMware ESX Server installs its own host operating system kernel that is highly optimized for virtual machine performance.
- ♦ **Virtual Machine:** The virtual hardware that you install a guest operating system on. It consists of virtual CPU, RAM, hard drive, and network interface resources.
- ♦ **Guest Operating System:** The operating system you install after installing VMware and creating a virtual machine. A VMware host server can have multiple guest operating systems running on it, such as NetWare and SLES 10.

For more information about VMware, see the *VMware Web site* (<http://www.vmware.com>).

E.2 Installation Guidelines for OES NetWare

This section provides guidelines specific to installing OES NetWare (NetWare 6.5 SP5 or later) on VMware GSX Server or VMware ESX Server. It is intended to be used in conjunction with the documentation for your chosen VMware product.

The overall installation process can be divided into several tasks:

- ♦ [Section E.2.1, “Selecting Suitable Hardware,” on page 198](#)
- ♦ [Section E.2.2, “Installing the VMware Software,” on page 199](#)
- ♦ [Section E.2.3, “Creating a New Virtual Machine,” on page 199](#)
- ♦ [Section E.2.4, “Installing OES NetWare as the Guest Operating System,” on page 200](#)
- ♦ [Section E.2.5, “Installing VMware Tools for NetWare,” on page 200](#)
- ♦ [Section E.2.6, “Additional Information,” on page 201](#)

E.2.1 Selecting Suitable Hardware

The hardware requirements for running VMware are more stringent than for dedicated servers running a single operating system. As a minimum, VMware recommends a two or more processor x86-based server with two network interface cards and sufficient memory and disk space. Refer to your VMware documentation for more information on hardware requirements and supported devices.

VMware hardware compatibility guides and other helpful documents are available on the *VMware Support Web site* (<http://www.vmware.com/support/resources>).

IMPORTANT: For better performance, VMware recommends that you install two or more network interface cards: one for the VMware console and at least one other for the guest operating systems to share.

E.2.2 Installing the VMware Software

Follow the instructions in the VMware documentation to install the VMware software and set up the system devices such as memory, hard disk storage, network interfaces, and other hardware devices connected to the VMware host server.

GSX Server supports any storage technology that the host operating system supports. Virtual disks can be located on any storage device accessible by the host operating system, including local IDE and SCSI disks, RAID arrays, SAN arrays, NAS and NFS file servers, and iSCSI.

ESX Server uses the VMware virtualization layer to present each virtual disk as a SCSI drive connected to a SCSI adapter. This abstraction eliminates the need to support device drivers from multiple vendors for the wide variety of SCSI, RAID, and other disk storage controllers that might actually be used in the system.

In most usage scenarios, it is best to use VMware's default partition setup. This selection erases any existing partition information on the disk.

The VMware installation process also installs the service console, which is used to configure, start, and administer virtual machines. Assign a static IP address, netmask, gateway, and other TCP/IP configuration parameters to the network interface to be used by the service console. All other network interface cards are initially disabled; you configure them later when you create a virtual machine.

When the VMware installation is complete, reboot the server.

E.2.3 Creating a New Virtual Machine

Follow the instructions in the VMware documentation to create a new virtual machine on your VMware server. The exact procedure varies depending on whether you have VMware GSX or ESX Server.

Be sure to select Novell NetWare 6 as the intended guest operating system during the virtual machine configuration. You can change the display name to be something more descriptive, such as "OES NetWare Server_1". This is the name that is listed in the VMware Management Interface to identify your virtual server.

When you configure the virtual disk, take special care in selecting the disk mode setting from the following options:

- ♦ **Persistent:** Changes are immediately and permanently written to the virtual disk.
- ♦ **Nonpersistent:** Changes are discarded when the virtual machine powers off.
- ♦ **Undoable:** Changes are saved, discarded, or appended at your discretion.
- ♦ **Append:** Changes are appended to a redo log file when the virtual machine powers off.

Whenever possible, you should create the virtual disk in persistent mode. In this mode, all writes are committed to the device immediately without creating a redo log file.

In undoable mode, VMware keeps a redo log file on the virtual disk, containing all of the pending changes. If you select this setting, be sure to leave enough free space for the redo file to grow to the size of the partition created for the virtual server. To avoid possible problems, the virtual disk should be set at twice the size of the Novell Storage Services™ (NSS) partition you intend to create for NetWare.

WARNING: If you create the virtual disk in undoable mode and don't have enough free space for the redo file, you might experience issues such as the NSS pool being deactivated or the NSS partition being deleted.

E.2.4 Installing OES NetWare as the Guest Operating System

To install a guest operating system, you use the VMware Remote Console on a different system than the one on which you've installed GSX or ESX Server. The basic steps are outlined below. For more complete instructions, refer to the VMware *Guest Operating System Installation Guide*.

- 1 Follow the instructions in the VMware documentation to start the Remote Console on a Linux or Windows workstation and connect to the virtual machine you have created.
- 2 Click *Power On* to start the virtual machine.
- 3 Insert *NetWare 6.5 SPx CD 1 (Operating System)* into the CD-ROM drive of the VMware server.
- 4 Boot the virtual server from the CD or DVD, using one of the following methods:
 - ♦ With the CD inserted, click *Power On* to start the virtual machine, press Esc when it comes up, and select the option to boot from the CD.
 - ♦ Change the server's BIOS options to boot from the CD drive first, then click *Power On* to start the virtual machine.
- 5 Proceed with the NetWare installation.

Follow the instructions in [Chapter 4, "Installing OES 2 SP1 NetWare \(Physical\),"](#) on page 37.

When you see a message about configuring a swap partition, do so. Otherwise, the number of virtual machines that can run simultaneously is severely limited.

If *NetWare 6.5 SPx CD 2 (Products)* does not mount when you are prompted to insert it, go into the VMware devices, disconnect the IDE CD-ROM channel, and then reconnect. The NetWare installation program should now detect and mount the Products CD.

E.2.5 Installing VMware Tools for NetWare

After you have installed OES NetWare, install VMware Tools for NetWare. Follow the instructions in the *VMware Knowledge Base* (http://www.vmware.com/support/kb/enduser/std_adp.php?p_faqid=340) for your VMware product.

The VMware Tools package provides required support for shared folders and for drag-and-drop operations. Other tools support time synchronization between NetWare and the host, copying and pasting between guest and host, automatic grabbing and releasing of the mouse cursor, and improved mouse performance.

Installing VMware Tools also installs and loads the CPU idler program. NetWare servers do not idle the CPU when the operating system is idle. As a result, a virtual machine takes CPU time from the host regardless of whether the NetWare server software is idle or busy. To prevent unnecessary slowdowns, VMware recommends that after you install VMware Tools, you keep the NetWare CPU idler program loaded.

E.2.6 Additional Information

For additional information about installing and running NetWare on VMware, see the following:

- ♦ [VMware Web site \(http://www.vmware.com\)](http://www.vmware.com)
- ♦ [Novell Cool Solutions for OES \(http://www.novell.com/coolsolutions/oes\)](http://www.novell.com/coolsolutions/oes)
- ♦ [Novell Support Web site for OES \(http://support.novell.com/products/openenterpriseserver\)](http://support.novell.com/products/openenterpriseserver)

Documentation Updates

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This section contains information on documentation content changes that were made in this NetWare Installation Guide after the SP1 release. The changes are listed according to the date they were published.

The documentation for this product is provided on the Web in two formats: HTML and PDF. The HTML and PDF documentation are both kept up-to-date with the changes listed in this section.

If you need to know whether a copy of the PDF documentation that you are using is the most recent, the PDF document includes a publication date on the title page.

The documentation was updated on the following dates:

March 9, 2009

Section Changed	Summary
Section 4.13.2, "Configuring Time Synchronization," on page 68	Included an Important note that Timesync should always be used when installing in a Xen VM.