

# Novell Open Enterprise Server

[www.novell.com](http://www.novell.com)

May 25, 2006

INSTALLATION GUIDE FOR  
NETWARE®



**Novell®**

## Legal Notices

Novell, Inc. makes no representations or warranties with respect to the contents or use of this documentation, and specifically disclaims any express or implied warranties of merchantability or fitness for any particular purpose. Further, Novell, Inc. reserves the right to revise this publication and to make changes to its content, at any time, without obligation to notify any person or entity of such revisions or changes.

Further, Novell, Inc. makes no representations or warranties with respect to any software, and specifically disclaims any express or implied warranties of merchantability or fitness for any particular purpose. Further, Novell, Inc. reserves the right to make changes to any and all parts of Novell software, at any time, without any obligation to notify any person or entity of such changes.

Any products or technical information provided under this Agreement may be subject to U.S. export controls and the trade laws of other countries. You agree to comply with all export control regulations and to obtain any required licenses or classification to export, re-export, or import deliverables. You agree not to export or re-export to entities on the current U.S. export exclusion lists or to any embargoed or terrorist countries as specified in the U.S. export laws. You agree to not use deliverables for prohibited nuclear, missile, or chemical biological weaponry end uses. Please refer to [www.novell.com/info/exports/](http://www.novell.com/info/exports/) for more information on exporting Novell software. Novell assumes no responsibility for your failure to obtain any necessary export approvals.

Copyright © 2006 Novell, Inc. All rights reserved. No part of this publication may be reproduced, photocopied, stored on a retrieval system, or transmitted without the express written consent of the publisher.

Novell, Inc. has intellectual property rights relating to technology embodied in the product that is described in this document. In particular, and without limitation, these intellectual property rights may include one or more of the U.S. patents listed at <http://www.novell.com/company/legal/patents/> and one or more additional patents or pending patent applications in the U.S. and in other countries.

Novell, Inc.  
404 Wyman Street, Suite 500  
Waltham, MA 02451  
U.S.A.  
[www.novell.com](http://www.novell.com)

*Online Documentation:* To access the online documentation for this and other Novell products, and to get updates, see [www.novell.com/documentation](http://www.novell.com/documentation).

## **Novell Trademarks**

For a list of Novell trademarks, see <http://www.novell.com/company/legal/trademarks/tmlist.html>.

## **Third-Party Materials**

All third-party trademarks are the property of their respective owners.



# Contents

<b>About This Guide</b>	<b>9</b>
<b>1 Preparing to Install or Upgrade to OES NetWare</b>	<b>11</b>
1.1 Understand the Install/Upgrade Options for OES NetWare	11
1.1.1 OES NetWare Deployment Options	13
1.1.2 Server Migration Tools	13
1.2 Meet Hardware and Software Requirements	13
1.2.1 Meeting System Requirements	13
1.2.2 Preparing the NetWare Installation Software	14
1.2.3 Other Software You Might Need	15
1.3 Plan Your OES Deployment	15
1.3.1 Determine What Services to Install	15
1.3.2 Plan Your eDirectory Tree	16
1.3.3 Rights Required for Installing OES NetWare Servers	16
1.3.4 Gather Server Hardware and IP Address Information	17
1.4 Prepare the Network with Deployment Manager	18
1.4.1 Deployment Manager Overview	18
1.4.2 Starting Deployment Manager	19
1.4.3 Network Preparation	20
1.4.4 Install/Upgrade Options	23
1.4.5 Post-Install Tasks	24
1.4.6 Exiting Deployment Manager	25
1.5 What's Next	25
<b>2 Installing OES NetWare</b>	<b>27</b>
2.1 NetWare Installation Prerequisites	27
2.2 Preparing the Computer	29
2.2.1 Installing Computer and Networking Hardware	29
2.2.2 Creating and Formatting a Boot Partition	29
2.2.3 Access the Installation Files	30
2.3 Starting the Installation Program	31
2.3.1 Navigating in the Character-Based Screens	32
2.4 Selecting the Initial Installation Settings	32
2.4.1 Selecting Default or Manual Installation	32
2.5 Switch to Graphical Display Mode	35
2.6 Choosing a Server Pattern	36
2.6.1 Customized NetWare Server	36
2.6.2 Basic Netware File Server	39
2.6.3 Pre-Migration Server	39
2.6.4 DNS/DHCP Server	41
2.6.5 exteNd J2EE Web Application Server	41
2.6.6 LDAP Server	42
2.6.7 NetWare AMP (Apache, MySQL, PHP, and PERL) Server	43
2.6.8 NetWare Backup Server	44
2.6.9 QuickFinder Server	44
2.6.10 Network Attached Storage (NAS) Server	45
2.6.11 Novell iPrint Server	46
2.6.12 Apache/Tomcat Server	46
2.6.13 Novell Nsure Audit Starter Pack Server	47

2.6.14	iSCSI SAN Storage Server	48
2.6.15	Management Server	49
2.6.16	Novell iFolder Storage Services	50
2.6.17	Virtual Office Server	50
2.7	Verifying Products to Install	51
2.8	Verifying Pattern Selection	52
2.9	Naming the Server	52
2.10	Installing Networking Protocols	53
2.10.1	About the Internet Protocol (IP)	54
2.10.2	About IPX	54
2.10.3	Using Both IP and IPX	55
2.10.4	Installing IP and IPX	55
2.11	Specifying a Hostname for Each IP Address	56
2.12	Setting Up Domain Name Service	57
2.13	Setting the Server Time Zone and Time Synchronization Method	57
2.13.1	Setting the Server Time Zone	57
2.13.2	Configuring Time Synchronization	58
2.14	Setting Up Novell eDirectory	59
2.14.1	Creating a New eDirectory Tree	59
2.14.2	Installing the Server into an Existing eDirectory Tree	60
2.14.3	eDirectory Summary	60
2.15	Licensing the NetWare Server	61
2.16	LDAP Configuration	61
2.17	Selecting the Login Method	62
2.18	DNS/DHCP Installation	62
2.19	iFolder Server Options	63
2.20	MySQL Options	63
2.21	exteNd Application Server - Details	64
2.22	exteNd Application Server - Database Options	64
2.23	Novell Nsure Audit Starter Pack - Component Selection	65
2.24	Novell Nsure Audit Starter Pack - Database Options	66
2.25	NetStorage Install	66
2.26	Completing the Server Installation	67
2.27	What's Next	68

### **3 Upgrading to OES NetWare 69**

3.1	Meeting System Requirements	69
3.1.1	Software Requirements	69
3.1.2	Hardware Requirements	70
3.1.3	NetWare Installation CDs	70
3.2	Preparing the Network with Deployment Manager	71
3.3	Preparing the Computer	71
3.3.1	Back Up the NetWare Server Files	72
3.3.2	Log Out Users Prior to Upgrading	72
3.3.3	Prepare Application Files Prior to Upgrading	72
3.3.4	Verify a Valid DOS Partition	72
3.3.5	Locate NetWare License Files	72
3.4	Starting an Upgrade	73
3.4.1	In-Place Upgrades	73
3.4.2	Remote Upgrades	74
3.4.3	Accepting the License Agreements	75
3.4.4	Health Check Summary	75
3.4.5	Back Up Server Files	76
3.4.6	Installing Additional Components	76

3.4.7	eDirectory Summary .....	77
3.4.8	Selecting the Login Method .....	77
3.5	Completing the Server Upgrade .....	78
3.6	Down-Server Upgrades .....	78
3.7	What's Next .....	78
<b>4</b>	<b>Installing Products and Updates</b>	<b>81</b>
4.1	Installing NetWare Licenses .....	81
4.2	Updating NSS Volumes .....	81
4.3	Installing or Updating Novell Client Software .....	82
4.4	Installing Product Updates .....	82
4.5	Installing Additional Products .....	82
4.6	Deploying eDirectory 8.8 .....	83
4.7	Other Post-Installation Tasks .....	83
<b>5</b>	<b>Installing OES NetWare on VMware</b>	<b>85</b>
5.1	Overview of VMware .....	85
5.1.1	VMware Product Versions .....	85
5.1.2	Terminology .....	86
5.2	Installation Guidelines for OES NetWare .....	86
5.2.1	Selecting Suitable Hardware .....	86
5.2.2	Installing the VMware Software .....	87
5.2.3	Creating a New Virtual Machine .....	87
5.2.4	Installing OES NetWare as the Guest Operating System .....	88
5.2.5	Installing VMware Tools for NetWare .....	88
5.2.6	Additional Information .....	89
<b>A</b>	<b>Keyboard Commands</b>	<b>91</b>
<b>B</b>	<b>Documentation Updates</b>	<b>93</b>
B.1	May 25, 2006 .....	93
B.2	March 3, 2006 .....	93
B.3	December 23, 2005 (OES Support Pack 2) .....	93
B.4	September 29, 2005 .....	93
B.4.1	Preparing to Install or Upgrade to OES for NetWare .....	94
B.4.2	Installing OES NetWare on VMware .....	94
B.5	August 19, 2005 (OES Support Pack 1) .....	94
B.5.1	Preparing to Install or Upgrade to OES for NetWare .....	94
B.5.2	Installing OES for NetWare .....	94
B.6	June 1, 2005 .....	95
B.6.1	Installing OES for NetWare .....	95
B.6.2	Installing Products and Updates .....	95



# About This Guide

Novell® Open Enterprise Server (OES) combines the strengths of NetWare® with the benefits of SUSE® Linux to give you a secure, highly available platform that provides proven file, print and application services in an open environment. This dual operating system foundation enables you to deploy your choice of the best technologies and services developed by the open source community, as well as fully developed proprietary services that routinely solve business problems for enterprise customers.

With OES, Novell gives you the flexibility to deploy enterprise-ready workgroup services on the NetWare 6.5 and SUSE Linux Enterprise Server 9 (SLES 9) platforms. You can select the platform mix that is best suited to your needs.

Use this guide for help with installing and configuring OES for the NetWare 6.5 platform, and for upgrading existing NetWare servers to OES NetWare. It is divided into the following sections:

- “Preparing to Install or Upgrade to OES NetWare” on page 11
- “Installing OES NetWare” on page 27
- “Upgrading to OES NetWare” on page 69
- “Installing Products and Updates” on page 81
- “Installing OES NetWare on VMware” on page 85

## Audience

This guide is intended for network installers and administrators.

## Feedback

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

## Documentation Updates

For the most recent version of the *OES NetWare Installation Guide*, see the [Novell Open Enterprise Server Documentation Web site \(http://www.novell.com/documentation/oes\)](http://www.novell.com/documentation/oes).

## Additional Documentation

If you want to install OES on the Linux\* platform, see the *OES Linux Installation Guide*.

For information on planning your OES deployment prior to installing your servers, see the *Novell OES SP2 Planning and Implementation Guide*.

For information relating to coexistence of OES services in existing networks and migrating NetWare services to OES Linux, see the *OES Coexistence and Migration Guide*.

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

- [Open Enterprise Server Deployment Page \(http://www.novell.com/products/openenterpriseserver/deployment.html\)](http://www.novell.com/products/openenterpriseserver/deployment.html)
- [Open Enterprise Server Product Page \(http://www.novell.com/oes\)](http://www.novell.com/oes)
- [Novell Cool Solutions \(http://www.novell.com/coolsolutions\)](http://www.novell.com/coolsolutions)
- [Novell Technical Services \(http://www.novell.com/support\)](http://www.novell.com/support)
- [Novell 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)

### **Documentation Conventions**

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

A trademark symbol (® , ™, etc.) denotes a Novell trademark. An asterisk (\*) denotes a third-party trademark.

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

# Preparing to Install or Upgrade to OES NetWare

# 1

Before you install or upgrade to Novell® Open Enterprise Server (OES) for NetWare®, you should review the information in the *Novell OES SP2 Planning and Implementation Guide* and in the *OES Coexistence and Migration Guide*.

You should also perform the tasks outlined in this section.

- [Section 1.1, “Understand the Install/Upgrade Options for OES NetWare,” on page 11](#)
- [Section 1.2, “Meet Hardware and Software Requirements,” on page 13](#)
- [Section 1.3, “Plan Your OES Deployment,” on page 15](#)
- [Section 1.4, “Prepare the Network with Deployment Manager,” on page 18](#)
- [Section 1.5, “What’s Next,” on page 25](#)

## 1.1 Understand the Install/Upgrade Options for OES NetWare

The NetWare server platform for OES Support Pack 2 is NetWare 6.5 with Support Pack 5. For ease of reference, this guide uses the term “OES NetWare” to mean Open Enterprise Server SP2 running on the NetWare 6.5 SP5 platform.

Novell no longer distinguishes between a NetWare 6.5 Support Pack installation and the OES NetWare installation. NetWare 6.5 SP5 and OES SP2 on NetWare are the same product and use the same installation program and CD set. Installing OES SP2 on NetWare is the same as installing NetWare 6.5 with Support Pack 5. Applying the NetWare 6.5 SP5 update is the same as upgrading to OES SP2 for NetWare.

When you install or upgrade to OES SP2 for NetWare, the following updated products are made available for you to install:

- Novell iManager 2.5

This is the cross-platform version of iManager which allows you to manage both OES NetWare and OES Linux servers. Version 2.5 also includes enhanced performance and a new administration interface that does not manage Virtual Office 1.0. For information about other changes from version 2.0.2, see the *Novell iManager 2.5 Administration Guide*.

- Novell QuickFinder™ Server 4.2 (replaces 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 *QuickFinder Server 4.2 Administration Guide*.

---

**NOTE:** If you install or upgrade QuickFinder Server using the NetWare installation program for OES SP2, the QuickFinder software is reported as version 4.2. However, the welcome pages for QuickFinder and other references continue to refer to it as version 4.0.

---

Virtual Office is not included in OES SP2. Existing Virtual Office installations will continue to run on servers updated to OES SP2. If you are creating a new OES SP2 NetWare server and want to install Virtual Office, download the Virtual Office 1.6.1 for NetWare update from the Novell Technical Support Web site (<http://support.novell.com/cgi-bin/search/searchtid.cgi?/2973716.htm>).

In OES SP1, the administration interface for Virtual Office was removed from iManager and incorporated into Virtual Office. You can install Virtual Office 1.6.1 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 1.6.1, 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*.

If you are upgrading from NetWare 6.5 FCS or later, Novell recommends that you run NWCONFIG and use Product Options to apply the SP5 updates from the update CD. This method upgrades QuickFinder to version 4.2. It also detects the version of iManager and applies either iManager 2.0.2 or iManager 2.5 updates as required.

If you want to upgrade iManager 2.0.2 to iManager 2.5, do a product install of iManager 2.5 using the Netware 6.5 SP5 overlay CDs *after* you have applied the SP5 updates in NWCONFIG.

Before upgrading from NetWare 5.1 or NetWare 6.0 using the overlay CDs, you should back up any server configuration files that you have customized. After the upgrade, you can restore the customized files if necessary.

You should also be aware that in OES NetWare, the following components have been removed and can no longer be selected for installation:

- Novell Nterprise™ Branch Office™ Rsync Server

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

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.

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

For information on the new features and functionality that are available in NetWare 6.5 from the OES perspective, see the following online documents:

- “What’s New on the NetWare Kernel of Novell Open Enterprise Server” ([http://www.novell.com/products/openenterpriseserver/docs/whats\\_new\\_nw65.pdf](http://www.novell.com/products/openenterpriseserver/docs/whats_new_nw65.pdf))
- “What’s New in Novell Open Enterprise Server SP1” (<http://www.novell.com/products/openenterpriseserver/whatsnew.html>)

## 1.1.1 OES NetWare Deployment Options

OES NetWare provides a number of server deployment options. These options are summarized in [Table 1-1](#).

**Table 1-1** OES NetWare Server Deployment Options

Install/Upgrade Option	When to Use	Documentation
New installation of OES NetWare on standard hardware	You have new server-class PC hardware and you want to install OES NetWare on it for the first time.	<a href="#">Chapter 2, “Installing OES NetWare,” on page 27</a>
Unattended installation of OES NetWare	You want to run an unattended or “silent” installation of OES NetWare using a response file.	<a href="#">OES NetWare Response File Installation Guide</a>
In-place upgrade of existing NetWare server to OES NetWare	You have an existing NetWare 5 or later server and you want to upgrade it to OES NetWare locally, from the server itself.	<a href="#">Chapter 3, “Upgrading to OES NetWare,” on page 69</a>
Remote upgrade of existing NetWare server to OES NetWare	You have an existing NetWare 5 or later server and you want to upgrade it to OES NetWare remotely, through Novell Deployment Manager or iManager.	<a href="#">Chapter 3, “Upgrading to OES NetWare,” on page 69</a>
Unattended upgrade of existing NetWare server to OES NetWare	You have an existing NetWare 5 or later server and you want to run an unattended or “silent” upgrade to OES NetWare using a response file.	<a href="#">OES for NetWare Response File Installation Guide</a>
New installation of OES NetWare on a VMware Virtual Machine	You have a VMware server and you want to install OES NetWare on it as a guest operating system.	<a href="#">Chapter 5, “Installing OES NetWare on VMware,” on page 85</a>

## 1.1.2 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 “[System Preparation and Deployment Tools](#)” in the *OES Coexistence and Migration Guide*.

## 1.2 Meet Hardware and Software Requirements

OES for 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.

### 1.2.1 Meeting System Requirements

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

## Minimum System Requirements

OES NetWare 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, OES NetWare 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 2.6, “Choosing a Server Pattern,” on page 36](#) 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.

- 4 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

## 1.2.2 Preparing the NetWare Installation Software

The installation and upgrade procedures described in this manual assume you are installing or upgrading to OES NetWare, which is the same product as NetWare 6.5 SP5.

You should download the NetWare 6.5 SP5 Operating System and Products CD overlay ISO images and burn them to CDs for use when installing or upgrading to OES NetWare.

For instructions on how to obtain the ISO images, see [“Getting and Preparing OES Software”](#) in the *Novell OES SP2 Planning and Implementation Guide*.

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

Label your NetWare installation CDs as shown in [Table 1-2](#).

**Table 1-2** OES NetWare Installation CD Labels

ISO Image	Label
oessp2nw65ossp5.iso	NetWare 6.5 SP5 CD 1 (Operating System)
oessp2nw65prodsp5.iso	NetWare 6.5 SP5 CD 2 (Products)

### 1.2.3 Other Software You Might Need

If you want to run the NetWare installation program from a source NetWare server running IP, you need the IP Server Connection Utility. See [TID 10074248](http://support.novell.com/cgi-bin/search/searchtid.cgi?/10074248.htm) (<http://support.novell.com/cgi-bin/search/searchtid.cgi?/10074248.htm>) for information about downloading the srvinst2.exe file.

The IP Server Connection Utility lets you log in to the source NetWare server from DOS on the machine you have prepared for OES NetWare. It provides a basic IP connection to complete an across-the-wire installation. Instructions are included with the download.

## 1.3 Plan Your OES Deployment

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

For detailed help in planning your OES deployment, see the *Novell OES SP2 Planning and Implementation Guide*.

For information about coexistence of OES servers with existing networks, as well as issues involved in migrating to OES from your current network environment, see the *OES Coexistence and Migration Guide*.

### 1.3.1 Determine What Services to Install

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

- Directory services and identity management including Novell eDirectory™ and Nsure Identity Manager
- File services including Novell Storage Services™ (NSS) and Novell iFolder®
- Print services including Novell iPrint
- Collaboration services including Virtual Office (not available in OES SP2)
- 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 will 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 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.

Novell recommends that you choose a pattern installation if one exists for the intended purpose of your server. Options are also provided to install basic and customized OES servers.

### 1.3.2 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.

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 8.7.3 Administration Guide*.

For more information on time synchronization with NTP, see the *Novell Network Time Protocol Administration Guide for OES*.

### 1.3.3 Rights Required for Installing OES NetWare Servers

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<sup>®</sup>/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 1.4, “Prepare the Network with Deployment Manager,” on page 18](#) 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 would 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 could then install subsequent OES NetWare servers without having to worry 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 Service (NMAST<sup>™</sup>) 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.

### **1.3.4 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 that drivers are not included for 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 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

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

## 1.4 Prepare the Network with 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.

### 1.4.1 Deployment Manager Overview

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 three sections: Network Preparation, Install/Upgrade Options, and Post-Install Tasks.

Network Preparation tasks:

- [“Back Up Data” on page 20](#)
- [“Search Tree for eDirectory/NDS Versions” on page 20](#)
- [“Prepare for New eDirectory” on page 20](#)
- [“Generate GUIDs on NetWare 4 Servers” on page 20](#)
- [“Prepare a Server for Upgrade” on page 21](#)
- [“Prepare Cluster for Upgrade” on page 21](#)
- [“Update Certificate Authority Objects” on page 21](#)
- [“Prepare for Universal Password” on page 22](#)
- [“Prepare for CIFS/AFP” on page 22](#)
- [“Verify NICI Keys” on page 22](#)
- [“Schema Update” on page 22](#)

Install/Upgrade Options tasks:

- [“Install NetWare 6.5” on page 23](#)
- [“Automate an Installation” on page 23](#)
- [“Upgrade to NetWare 6.5” on page 23](#)
- [“Consolidate or Migrate Servers” on page 23](#)

Post-Install tasks:

- “[Create Additional Volumes](#)” on page 24
- “[Install NetWare 6.5 Products](#)” on page 24
- “[Use DSREPAIR](#)” on page 24
- “[Install/Upgrade Cluster](#)” on page 24
- “[Remove Deployment Manager](#)” on page 25

## 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.

### NetWare 6.5 and OES NetWare Servers

If you already have a NetWare 6.5 or OES NetWare 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.

### Older Versions of NetWare

If you are upgrading NetWare 4, 5, or 6.0 servers to OES NetWare, go through all of the tasks and complete those that apply to your version of NetWare.

### 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 Linux Installation Guide](#) for information about preparing a Linux server for OES.

## 1.4.2 Starting Deployment Manager

Deployment Manager is run from a Windows\* workstation on the network and 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 *NetWare 6.5 SP5 CD 1 (Operating System)* and go to the root of the CD.
- 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.  
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.

### 1.4.3 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.

#### Back Up Data

If you are upgrading an existing NetWare server to NetWare 6.5 or OES NetWare, you should back up the server data and the eDirectory data.

Backing up your data is an optional task, but one that Novell recommends you complete.

Choose this task and follow the displayed instructions to back up any server data and Novell eDirectory data.

#### Search Tree for eDirectory/NDS Versions

The NetWare 6.5/OES NetWare server installation installs a new version of eDirectory. Before you upgrade or install your first NetWare 6.5 or OES NetWare server, a compatible version of NDS or eDirectory *must* be running on all servers in your tree.

This task checks the NetWare and NDS versions of all servers in your tree and updates NetWare 4/NDS 6 and NetWare 5/NDS 7 and 8 servers to be compatible with eDirectory. It does not update NetWare servers already running eDirectory.

Choose this task to search the tree for NDS versions that need to be updated.

#### 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 that you have already completed the Search Tree for eDirectory/NDS Versions task and updated NetWare 4/NDS 6 and NetWare 5/NDS 7 servers to be compatible with eDirectory as described in [“Search Tree for eDirectory/NDS Versions” on page 20](#). It also requires access to a server with a Read/Write replica of the Root partition.

Choose this task and follow the displayed instructions to extend the schema.

#### Generate GUIDs on NetWare 4 Servers

If you have NetWare 4.11 or 4.2/NDS 6 servers in your tree, you should generate GUIDs before upgrading to NetWare 6.5 or OES NetWare.

---

**IMPORTANT:** The GUID generator in Deployment Manager does not work with NetWare 4.10 servers, only with 4.11 or 4.2 servers. If there is a NetWare 4.10 server in your tree, it must be removed or you cannot install a new NetWare 6.5 server.

---

Choose this task and follow the displayed instructions to generate the necessary GUIDs.

This task requires that you update NetWare 4.11 or 4.2/NDS 6 servers to be compatible with eDirectory as described in “[Search Tree for eDirectory/NDS Versions](#)” on page 20 and extend the core schema of your tree as described in “[Prepare for New eDirectory](#)” on page 20. These tasks copied a new `ds.nlm` and a new `sguid.nlm` that support GUID generation to each selected NetWare 4 server. With these updated files in place, and with the core schema extended and synchronized, when `ds.nlm` is restarted on a NetWare 4.11 or 4.2/NDS 6 server, it automatically generates GUIDs for objects in master replicas on that server.

Even though the GUID generator for NetWare 4 helps to avoid GUID compatibility issues, problems can still occur. Always back up all file system trustees before any upgrade or migration to NetWare 6.5. If a problem does occur, see [TID# 10078892 - Trustee Assignments Appear to No Longer Work After NetWare 4.x to NetWare 6.x Upgrade](#) (<http://support.novell.com/cgi-bin/search/searchtid.cgi?/10078892.htm>) or the AppNote titled [NetWare 6 Trustee Rights: How They Work and What to Do When It All Goes Wrong](#) (<http://developer.novell.com/research/appnotes/2003/february/02/a030202.html>) for more information.

### **Prepare a Server for Upgrade**

This task runs a health check utility on an existing NetWare server to ensure that there is enough memory, a `sys:` volume is in place, and the server meets the minimum requirements for the upgrade. The utility reports if problems are detected that could cause the upgrade to fail.

### **Prepare Cluster for Upgrade**

If you are upgrading Novell Cluster Services™ from NetWare 5.1 and your cluster has shared storage, you must prepare your NetWare 5.1 cluster servers before upgrading them to OES NetWare and before upgrading Novell Cluster Services. This preparation is necessary to ensure existing shared-volume trustee assignments can be used after the upgrade.

This task is necessary only if you are upgrading from a NetWare 5.1 cluster to OES NetWare, not if you are upgrading from a NetWare 6.0 cluster.

### **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 here to properly upgrade from the NetWare 5.0 PKI and to correctly configure your network for Novell Certificate Server.

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 had used case-sensitive passwords.

If you plan to enable Universal Password, choose this task. It is an informational step only, containing a link to information about [Universal Password deployment \(http://www.novell.com/documentation/nmas23/admin/data/allq21t.html\)](http://www.novell.com/documentation/nmas23/admin/data/allq21t.html) which 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\* Macintosh\* 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 two 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.

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 NICI 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.

Choose this task and follow the displayed instructions to check your eDirectory tree for SDI key consistency. If any invalid keys exist, they should be fixed 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 4/NDS 6 and 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, choose this task before upgrading or installing new servers to allow the schema updates to synchronize to all partitions in your tree.

## 1.4.4 Install/Upgrade Options

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

### 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, choose this task for links to instructions and prerequisites.

### Automate an Installation

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 the *OES for NetWare Response File Installation Guide*.

### Upgrade to NetWare 6.5

If the NetWare server that you are upgrading meets the minimum hardware requirements for OES NetWare, choose this task for upgrade instructions.

You can also access the remote upgrade utility from this task.

### Consolidate or Migrate Servers

In OES SP1, the Novell Server Consolidation Utility 4.1 and the NetWare Migration Wizard 8.1 were combined under a single launch interface called the Novell Server Consolidation and Migration Toolkit. The launch interface asks you what type of consolidation or migration project you want to perform and then launches the appropriate utility automatically.

With Server Consolidation Utility 4.1, you can copy data from any number of NetWare servers to OES servers on either NetWare or Linux.

You can also copy data from servers in Windows NT\* 4.0 or Windows 2000/2003 domains to OES servers in a Novell eDirectory tree. Shared folders are migrated to a NetWare or Linux file system and Windows permissions are converted to NetWare or Linux equivalents. During the consolidation, the domain users and local/global groups are converted to eDirectory objects and placed in the destination tree.

You can also use the Server Consolidation Utility to reassign NDPS<sup>®</sup> Printer Agents to an NDPS Printer Manager in the same eDirectory tree, or to migrate an iPrint printing configuration from an OES NetWare (6.5 FCS through SP5) environment to the OES Linux environment.

With NetWare Migration Wizard 8.1, you can migrate file system and NDS/eDirectory data from an existing NetWare 4, 5, or 6 server to a new OES NetWare server on your network. After the migration, the new server replaces and assumes the identity of the old one.

You can install the toolkit from this task in Deployment Manager. Click the Install/Run the Server Consolidation and Migration Toolkit link. If you have already installed the toolkit, clicking this link starts the toolkit.

## 1.4.5 Post-Install Tasks

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

### 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, 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.

Choose this task for additional information on running DSRepair.

### Install/Upgrade Cluster

This task is to be performed after you have completed the task to prepare your NetWare 5.1 cluster servers. It is not necessary if you are upgrading a NetWare 6.0 or 6.5 cluster.

You should have already completed the following:

- Identify the servers to be upgraded from NetWare 5.1 to OES NetWare
- Run the cluster preparation utility on each NetWare 5.1 server as described in [“Prepare Cluster for Upgrade” on page 21](#)

Choose this task to run the Novell Cluster Services install/upgrade utility.

## 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 is run 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, choose this task.

### 1.4.6 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.

## 1.5 What's Next

To take advantage of OES on the NetWare 6.5 platform, start by installing or upgrading your servers. See [Chapter 2, “Installing OES NetWare,” on page 27](#) and [Chapter 3, “Upgrading to OES NetWare,” on page 69](#).



# Installing OES NetWare

# 2

This section describes how to install Novell® Open Enterprise Server (OES) for NetWare® on standard server hardware. If you are upgrading from a previous version of NetWare, see [Chapter 3, “Upgrading to OES NetWare,”](#) on page 69.

Installing a new server includes the following tasks:

- [“Preparing the Computer”](#) on page 29
- [“Starting the Installation Program”](#) on page 31
- [“Selecting the Initial Installation Settings”](#) on page 32
- [“Choosing a Server Pattern”](#) on page 36
- [“Naming the Server”](#) on page 52
- [“Installing Networking Protocols”](#) on page 53
- [“Setting Up Domain Name Service”](#) on page 57
- [“Setting the Server Time Zone and Time Synchronization Method”](#) on page 57
- [“Setting Up Novell eDirectory”](#) on page 59
- [“Licensing the NetWare Server”](#) on page 61
- [“Selecting the Login Method”](#) on page 62
- [“Completing the Server Installation”](#) on page 67

## 2.1 NetWare Installation Prerequisites

Depending on your NetWare and NDS®/eDirectory™ versions, certain conditions must be met before you can install an OES NetWare server into an existing network.

### NetWare 4 Trees

- The server cannot be installed in a tree that contains NetWare 4.10 servers. All servers in the tree must be NetWare 4.11 or later.
- To ensure that Licensing works properly, all NetWare 4.11 and 4.2 servers in your tree need to be at Support Pack 9 or later.

---

**NOTE:** Novell recommends installing the latest available Support Packs on all NetWare servers in your tree.

---

- Novell recommends that you install OES NetWare servers into a tree that has Novell eDirectory 8.7 or later.

Although you can deploy OES NetWare servers into a NetWare 4.x tree running NDS 6.21, installing into a tree with a version earlier than eDirectory 8 can make User objects unmanageable when using management utilities other than those that ship with OES NetWare.

Before installing an OES NetWare server into a pure NetWare 4.x tree, run the Deployment Manager utility and follow the directions to copy updated NetWare 4 NDS files to the network, generate

GUIDs, and update the schema. See [Section 1.4, “Prepare the Network with Deployment Manager,” on page 18](#) for more information.

After running the Deployment Manager, but before attempting to install the OES NetWare server, do the following.

---

**NOTE:** These steps are necessary only in a pure NetWare 4 tree. If any NetWare 5.1 or NetWare 6.0 servers already exist in the tree, this procedure is not necessary.

---

- 1 Run DSRepair on a server that holds a writable copy of the Root partition.
- 2 Select *Advanced Options Menu > Global Schema Operations*.
- 3 Log in as the Admin, if necessary, then run the Post NetWare 5 Schema Update.
- 4 After the Post NetWare 5 Schema Update completes, return to the main menu and select *Advanced Options Menu > Repair Local DS Database*.
- 5 Set the *Rebuild Operational Schema* option to *Yes*.
- 6 Run the local database repair.

### NetWare 5 Trees

- To ensure that Licensing works properly, all NetWare 5 servers in your tree need to be at the following minimum Support Pack level:

NetWare 5.0 servers must be at Support Pack 6a or later

NetWare 5.1 servers must be at Support Pack 8 or later

---

**NOTE:** Novell recommends installing the latest available Support Packs on all NetWare servers in your tree.

---

- 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.

---

- Novell recommends that you install OES NetWare servers into a tree that has Novell eDirectory 8.7 or later.

Although you can deploy OES NetWare servers in a NetWare 5.x tree running NDS 7.62c or 8.85c, installing into a tree with a version earlier than eDirectory 8 can make User objects unmanageable when using management utilities other than those that ship with OES NetWare.

- Before you introduce an OES NetWare server into an existing network, you must run the NetWare Deployment Manager to update the network. See [Section 1.4, “Prepare the Network with Deployment Manager,” on page 18](#) for more information.

### NetWare 6 Trees

- Novell recommends that you install OES NetWare servers into a tree that has Novell eDirectory 8.7 or later.

Installing into a tree with a version earlier than eDirectory 8 can make User objects unmanageable when using management utilities other than those that ship with NetWare 6.5.

- ❑ All NetWare 6.0 servers in your tree need to be at Support Pack 5 or later.

---

**NOTE:** Novell recommends installing the latest available Support Packs on all NetWare servers in your tree.

---

- ❑ Before you introduce an OES NetWare server into an existing network, you must run the NetWare Deployment Manager to update the network. See [Section 1.4, “Prepare the Network with Deployment Manager,” on page 18](#) for more information.

## 2.2 Preparing the Computer

To prepare your computer for the OES NetWare installation:

1. Install the computer and networking hardware (see [“Installing Computer and Networking Hardware” on page 29](#)).
2. Create and format a boot partition (see [“Creating and Formatting a Boot Partition” on page 29](#)).
3. Access the installation files (see [“Access the Installation Files” on page 30](#)).

### 2.2.1 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.

### 2.2.2 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 [“Access the Installation Files” on page 30](#).

---

**TIP:** You should increase the size of your boot partition to accommodate your specific configuration requirements. See [“Meeting System Requirements” on page 13](#).

---

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 13](#) 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.

## 2.2.3 Access the Installation Files

OES NetWare can be installed from the server's local CD 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 NetWare Installation from a Network Drive" below.

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 2.3, "Starting the Installation Program," on page 31](#).

### 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 software.
- 5 Copy the contents of both *NetWare 6.5 SP5 CD 1 (Operating System)* and *NetWare 6.5 SP5 CD 2 (Products)* to the same directory on your network. In copying these two CDs to the network, you may 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.

### 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.

### Anticipating Installation Issues

- 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 will finish. An error will be generated telling you which individual product installation failed, but the remaining products will install normally.

- For a list of known install-related issues in this release of OES NetWare, see the “NetWare Install/Upgrade” section of the *Open Enterprise Server Readme*.

## 2.3 Starting the Installation Program

To start the OES NetWare installation program, complete any of the following:

- To use the bootable NetWare option, insert *NetWare 6.5 SP5 CD 1 (Operating System)* and boot the computer. Unless you press a key to interrupt the installation preparation, the OES NetWare Install program will launch 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 ...]
```

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 CD drive letter and enter `install`.
- To run the OES NetWare Install program from a network drive, log in to the network, access the directory where you copied the installation files, and enter `install`.

---

**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.

---

## 2.3.1 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.

## 2.4 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.

---

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

---

### 2.4.1 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

- 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

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* to 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 Complete one of the following:

If you need to change the default settings, select *Back* and press Enter. This takes you back a 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 will 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 From 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 onscreen 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 2.5, “Switch to Graphical Display Mode,” on page 35](#).

## 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 From 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, then the installation will modify the boot sector to load NetWare instead of DOS. If DOS is selected and NetWare is the normal boot OS, then 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 will display 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 will be detected and you will be 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.
- 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. To create or modify any of the options presented:

- 1 Select the desired option and press Enter.
- 2 Follow the on-screen prompts, and when finished, return to the Main Menu.  
For more information, see “**NSSMU for NetWare**” in the *OES Utilities Reference*.
- 3 Select *Continue Installation* and press Enter.

## 2.5 Switch 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 will now continue for a few minutes. The OES NetWare installation program will then continue in graphical display mode.

Although a mouse is recommended, you can use keyboard commands to navigate through the installation program. For more information on keyboard commands, see [Appendix A, “Keyboard Commands,”](#) on page 91 for a table listing the graphical mode keyboard actions.

The following sections explain how to complete the OES NetWare installation.

## 2.6 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 on 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:

- [Customized NetWare Server \(page 36\)](#)
- [Basic Netware File Server \(page 39\)](#)
- [Pre-Migration Server \(page 39\)](#)
- Pre-configured Servers
  - [DNS/DHCP Server \(page 41\)](#)
  - [exteNd J2EE Web Application Server \(page 41\)](#)
  - [LDAP Server \(page 42\)](#)
  - [NetWare AMP \(Apache, MySQL, PHP, and PERL\) Server \(page 43\)](#)
  - [NetWare Backup Server \(page 44\)](#)
  - [QuickFinder Server \(page 44\)](#)
  - [Network Attached Storage \(NAS\) Server \(page 45\)](#)
  - [Novell iPrint Server \(page 46\)](#)
  - [Apache/Tomcat Server \(page 46\)](#)
  - [Novell Nsure Audit Starter Pack Server \(page 47\)](#)
  - [iSCSI SAN Storage Server \(page 48\)](#)
  - [Management Server \(page 49\)](#)
  - [Novell iFolder Storage Services \(page 50\)](#)
  - [Virtual Office Server \(page 50\)](#)

The following sections provide additional information about the individual installation patterns and the products they will install on your server.

### 2.6.1 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<sup>®</sup> Storage Services lets you set up a software solution that lets your users' files 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
  - WAN Connectivity
- Novell Virtual Office (not available in OES SP2) lets you set up a software solution that 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. Selecting this component also requires you to select these components:
  - Apache 2 Web Server and Tomcat 4 Servlet Container
  - iPrint
  - Novell eGuide
  - Novell iFolder Storage Services
  - Novell iManager
  - Novell NetStorage
  - QuickFinder<sup>™</sup> Server

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

The product components listed in [Table 2-1](#) 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 2-1** *Default Components Installed with Customized and Pre-configured Server Patterns*

Component	Description
Apache 2 Admin Server 2.0.54	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 8.7.3.7	Novell's cross-platform directory service for controlling users and network resources
eDirectory Management Utilities Toolbox 8.7.3	Java-based tools for accessing eDirectory backend utilities, such as DSRepair, DSMerge, Backup and Restore, and Service Manager, remotely as well as 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) 4.0.1	browser-based management utility for server health monitoring
Novell Certificate Server™ 2.7.6	eDirectory component that allows the administrator to mint, issue, and manage digital certificates
Novell International Cryptographic Infrastructure (NICI) 2.6.7	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 (NMASTM) 2.4.0	login framework that provides developers the ability to integrate multiple authentication services using eDirectory systems
Novell Script for NetWare 2.0	NetWare-based scripting language with PHP and Perl support
Novell TLS Library 1.8.3	cryptographic protocol which provides secure communications on the Internet; successor to Secure Sockets Layer (SSL)

Component	Description
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, a general-purpose scripting language for creating scripts on the Web
PHP 5.0.5	Novell's implementation of PHP, 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) 1.1.3	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 4.1.31	administrative instance of Tomcat 4

After selecting the components you want and clicking *Next*, continue with [Section 2.7, “Verifying Products to Install,”](#) on page 51.

## 2.6.2 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 2-1](#) on page 38.

After selecting this option, click *Next* and then proceed to [Section 2.8, “Verifying Pattern Selection,”](#) on page 52.

## 2.6.3 Pre-Migration Server

This option installs a NetWare server that an existing server will be migrated to at a later time 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 55](#).

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 2.8, “Verifying Pattern Selection,” on page 52](#).

## 2.6.4 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 2.5
- Files installed by default. See [Table 2-1 on page 38](#).

For information about configuring DNS/DHCP after the installation, see the *Novell DNS/DHCP Services for NetWare Administration Guide for OES*.

After selecting this option, click *Next* and then proceed to [Section 2.8, “Verifying Pattern Selection,” on page 52](#).

## 2.6.5 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 \(http://www.novell.com/documentation/lg/workbench41/docs/relnotes.html\)](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 2.5
- WAN Connectivity
- WAN Traffic Manager Services
- Files installed by default. See [Table 2-1 on page 38](#).

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 2.8, “Verifying Pattern Selection,” on page 52](#).

## 2.6.6 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 2-1 on page 38](#).

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 2.8, “Verifying Pattern Selection,” on page 52](#).

## 2.6.7 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 2-1 on page 38](#).

After selecting this option, click *Next* and then proceed to [Section 2.8, “Verifying Pattern Selection,” on page 52](#).

## 2.6.8 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 2.5
- Files installed by default. See [Table 2-1 on page 38](#).

For information about configuring SMS after the installation, see the *Storage Management Services Administration Guide*.

After selecting this option, click *Next* and then proceed to [Section 2.8, “Verifying Pattern Selection,” on page 52](#).

## 2.6.9 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 2-1 on page 38](#).

For information about configuring QuickFinder after the installation, see the *QuickFinder Server 4.2 Administration Guide*.

After selecting this option, click *Next* and then proceed to [Section 2.8, “Verifying Pattern Selection,” on page 52](#).

## 2.6.10 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 2-1 on page 38](#).

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

After selecting this option, click *Next* and then proceed to [Section 2.8, “Verifying Pattern Selection,” on page 52](#).

## 2.6.11 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 2.5
- Files installed by default. See [Table 2-1 on page 38](#).

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

After selecting this option, click *Next* and then proceed to [Section 2.8, “Verifying Pattern Selection,” on page 52](#).

## 2.6.12 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 2.5
- Files installed by default. See [Table 2-1 on page 38](#).

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 2.8, “Verifying Pattern Selection,” on page 52](#).

## 2.6.13 Novell Nsure Audit Starter Pack Server

This option installs the centralized auditing service that is built into OES NetWare. The auditing service collects security and system event data, filters the collected information to trigger real-time e-mail notifications, and enables centralized logging to a single data store.

### 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 Nsure Audit Starter Pack Server option creates a dedicated auditing 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 2.5

- Novell Nsure Audit Starter Pack
- Nsure Audit Instrumentation
- Nsure Audit Platform Agent
- Files installed by default. See [Table 2-1 on page 38](#).

For information about configuring the Novell Nsure Audit Starter Pack Server after the installation, see the *Novell Nsure Audit 1.0.3 Administration Guide*.

After selecting this option, click *Next* and then proceed to [Section 2.8, “Verifying Pattern Selection,” on page 52](#).

## 2.6.14 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 2-1 on page 38](#).

For information about configuring the iSCSI SAN Storage Server after the installation, see the *iSCSI 1.1.3 Administration Guide for NetWare 6.5*.

After selecting this option, click *Next* and then proceed to [Section 2.8, “Verifying Pattern Selection,” on page 52](#).

## 2.6.15 Management Server

This option installs Novell iManager 2.5 and Novell ConsoleOne 1.3.6 network administration software. Both products together provide a complete management solution for your OES NetWare server.

Novell iManager 2.5 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
- 4 GB hard drive

### Recommended System Requirements

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

### Recommended 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
- Novell iManager 2.5
- iManager plug-ins (.npm files)
- Files installed by default. See [Table 2-1 on page 38](#).

For information about configuring iManager after the installation, see the *Novell iManager 2.5 Administration Guide*.

After selecting this option, click *Next* and then proceed to [Section 2.8, “Verifying Pattern Selection,” on page 52.](#)

## 2.6.16 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 2-1 on page 38.](#)

For information about configuring Novell iFolder 2.1 after the installation, see the [Novell iFolder 2.1 Installation and Administration Guide.](#)

After selecting this option, click *Next* and then proceed to [Section 2.8, “Verifying Pattern Selection,” on page 52.](#)

## 2.6.17 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 is not included in OES SP2. If you want to install Virtual Office, download the Virtual Office 1.6.1 for NetWare update from the [Novell Technical Support Web site \(http://](#)

[support.novell.com/cgi-bin/search/searchtid.cgi?/2973716.htm](http://support.novell.com/cgi-bin/search/searchtid.cgi?/2973716.htm)). See [Section 1.1, “Understand the Install/Upgrade Options for OES NetWare,”](#) on page 11 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
- Novell iFolder Storage Services
- Novell iManager 2.5
- Novell NetStorage
- Novell Virtual Office
- QuickFinder Server
- WAN Connectivity
- Files installed by default. See [Table 2-1 on page 38](#).

For information about configuring Virtual Office after the installation, see the [Novell Virtual Office Configuration Guide](#).

After selecting this option, click *Next* and then proceed to [Section 2.8, “Verifying Pattern Selection,”](#) on page 52.

## 2.7 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.

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*.

(Conditional, if installing from CD) When prompted, remove *NetWare 6.5 SP5 CD 1 (Operating System)*, insert *NetWare 6.5 SP5 CD 2 (Products)*, and click *OK*.

Proceed to [Section 2.9, “Naming the Server,”](#) on page 52.

## 2.8 Verifying Pattern Selection

After selecting 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.

If you want 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.

(Conditional, if installing from CD) When prompted, remove *NetWare 6.5 SP5 CD 1 (Operating System)*, insert *NetWare 6.5 SP5 CD 2 (Products)*, and click OK.

Proceed to the next section, [Naming the Server](#).

## 2.9 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.

### (Optional) Edit the Config.sys File

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

- 1 From 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 screen.
- 4 Click *OK*.

### (Optional) Edit the Autoexec.bat File

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

- 1 From 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 screen.
- 4 Click *OK*.

### (Optional) Specify 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 From 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*.

### **(Optional) Select Language Options**

NetWare can be customized to function in several languages.

- 1 From 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 box next to 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*.  
After completing the previous optional steps, you will now be back at the Server Properties page.
- 7 Click *Next*.

## **2.10 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 using IP and IPX.

- [“About the Internet Protocol \(IP\)” on page 54](#)
- [“About IPX” on page 54](#)
- [“Using Both IP and IPX” on page 55](#)
- [“Installing IP and IPX” on page 55](#)

## 2.10.1 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 will connect 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 will automatically bind 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 will process 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 will process only IP packets. Applications that require IPX will not function properly.

---

## 2.10.2 About IPX

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

During the installation program, existing IPX frame types will be detected. The installation program will detect one of the following conditions.

- **A single IPX frame type:** If a single frame type is detected, it will be installed.
- **Multiple IPX frame types:** If detected, you will be prompted to choose the frame types that you want to install.
- **No IPX frame types:** If no frame types are detected, Ethernet\_802.2 will be installed by default.

## 2.10.3 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 will process IP requests using IP, and it will broadcast and reply to IPX requests using IPX.

## 2.10.4 Installing IP and IPX

- 1 From 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 delta_digit_number` command after the `SERVERNAME` command in `autoexec.ncf`.

- 5 Repeat **Step 1** through **Step 4** for each network board in the server.

### (Optional) 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 From 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, check 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*.

### (Optional) Configuring SNMP

Network management utilities use Simple Network Management Protocol (SNMP) to record and communicate information about network devices. Using an SNMP-compatible utility, you can 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 From 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*.

### (Optional) 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 From 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 box in [“Installing IP and IPX” on page 55](#).
  - 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 55](#).

NetWare regulates IP and IPX protocols using a Migration Agent. A Migration Agent 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 screen.

- 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*.

After completing the previous optional steps, you are taken back to the Protocols page.
- 6 Click *Next*.

## 2.11 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, see [Section 2.12, “Setting Up Domain Name Service,” on page 57](#).

You must specify a hostname for each of the IP addresses that were bound in [Section 2.10, “Installing Networking Protocols,” on page 53](#). The hostname is the name of the DNS server that will resolve to your IP address. If you do not know the hostname, 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*.

## 2.12 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 this server will not be available to the Internet, you can skip this screen 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 2.10, “Installing Networking Protocols,” on page 53](#), the Host Name field will not display on this screen. This is because you specified the hostname on the [Specifying a Hostname for Each IP Address](#) screen described in the previous step. The remainder of this screen 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, check the *Verify the DNS Information* check box.
  - 3 Click *Next*.

## 2.13 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.

### 2.13.1 Setting the Server Time Zone

Follow these steps to set the server's 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 using Network Time Protocol (NTP).

To change the default time synchronization settings, continue with the time synchronization configuration instructions below. Otherwise, skip to [Section 2.14, “Setting Up Novell eDirectory,” on page 59](#)

## 2.13.2 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:

- 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 [Novell Network Time Protocol Administration Guide for OES](#).

- 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 [Network Time Management for NetWare Administration Guide for OES](#).)

- 4 (Optional) If you do not want to accept the defaults, configure Timesync time sources by checking 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), check the *NTP* check box to the right of the time source.

5 Click *OK*.

After completing the previous, optional steps, you will now be back at the Time Zone page.

6 Click *Next*.

## 2.14 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 the concepts relating to eDirectory trees, containers, and context.

- **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.

To set up eDirectory, choose either to create a new eDirectory tree or to install the server into an existing eDirectory tree, then click *Next*.

Continue with the section below that corresponds to your choice.

- [Creating a New eDirectory Tree \(page 59\)](#)
- [Installing the Server into an Existing eDirectory Tree \(page 60\)](#)

### 2.14.1 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 will only be 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 click the *Browse* button to create new containers in the tree.

3 Type the context for the Admin user.

By default, the Admin user is created in the same context as the Server object of the first server installed in the tree.

4 Type a password for the Admin user.

5 Retype the password for the Admin user.

6 Click *Next*.

## 2.14.2 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 also create new containers during the installation program.

- 1 Type the tree name in the field provided or click the *Tree* button to see a list of known eDirectory trees.
- 2 Type the context for the Server object in the field provided or click the *Browse* button to browse to the desired container in the tree.

If you click *Browse*, you can add or delete containers in the tree.

- 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 1.4, “Prepare the Network with Deployment Manager,”](#) on page 18.

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 SP5 CD 1 (Operating System)* CD 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 will be prompted to modify the schema. When prompted, you must provide the administrator name and password for the entire eDirectory tree.

---

## 2.14.3 eDirectory Summary

The eDirectory Summary screen 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 screen is accurate.
- 2 Record the Admin password and any other relevant information before proceeding.
- 3 Click *Next*.

## 2.15 Licensing the NetWare Server

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

- Use the 90-day evaluation license: This is the license included on the NetWare installation CDs in the `/License` folder.

You can use the same license files for all NetWare servers installed during the evaluation period.

- Use a standard purchased license: This is the license you receive when you purchase OES NetWare from a Novell Authorized Reseller. It includes two files: a foundation key (`.nfk`) file and a license (`.nlf`) file.

If you have already installed the server with the evaluation license, you must use Novell iManager to delete the evaluation license and install the standard license.

- 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 additional user licenses.

Follow these steps 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 2.16, “LDAP Configuration,” on page 61](#).
- 2 To install the server with a license, click the *Browse* button and browse to the location of the license files:
  - The evaluation license file is located on either of the NetWare installation CDs in the License folder.
  - Standard license files can be located on a diskette, on the server's DOS partition, or on another server in the tree.
- 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 and then click *Next*.

For instructions on how to delete or install licenses by using iManager after the server installation, see [Section 4.1, “Installing NetWare Licenses,” on page 81](#).

## 2.16 LDAP Configuration

If you selected a Manual Installation at the beginning of the OES NetWare installation, (see [“Selecting Default or Manual Installation” on page 32](#)), you will 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 2.17, “Selecting the Login Method,” on page 62](#).

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

## 2.17 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 checking the appropriate check boxes on the Novell Modular Authentication Service screen. 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 (NMAS) 2.3 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.

---

## 2.18 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 2.19, “iFolder Server Options,” on page 63](#).

You must specify the NDS 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 NDS context. To change the context from the default:

- 1 (Optional) Click the *Tree* button to the right of the DNS/DHCP Locator Object NDS Context field.
  - 1a Browse to and select the context that you want.
  - 1b Click *OK*.
- 2 (Optional) Click the *Tree* button to the right of the DNS/DHCP Group Object NDS Context field.
  - 2a Browse to and select the context that you want.
  - 2b Click *OK*.
- 3 (Optional) Click the *Tree* button to the right of the RootSrvr Zone NDS Context field.
  - 3a Browse to and select the context that you want.

**3b** Click *OK*.

**4** Click *Next*.

## 2.19 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 2.20, “MySQL Options,” on page 63](#).

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*.

## 2.20 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 2.21, “exteNd Application Server - Details,” on page 64](#).

**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) Check the *Secure Installation* check box if you want secure installation enabled.

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 checked, 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*

## 2.21 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 2.23, "Novell Nsure Audit Starter Pack - Component Selection," on page 65](#).

- 1 Type the user name for the application server's administration account in the field provided.

The install will create a user with this name and assign 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 the *Restrict Access* check box 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*.

## 2.22 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 2.23, "Novell Nsure Audit Starter Pack - Component Selection," on page 65](#).

- 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 will create a user with this name in the MySQL database and grant 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 the *Execute SilverMasterInit* check box if you want to populate the MySQL database with the SilverMaster system tables needed by the application server.

The default state of this option is checked. Keep the SilverMasterInit setting checked unless this install is for a secondary application server in a cluster.

- 8 Click *Next*.

## 2.23 Novell Nsure Audit Starter Pack - Component Selection

If Novell Nsure Audit Starter Pack was one of the products you selected to install on the Components page, or if you selected the Novell Nsure Audit Starter Pack pattern installation, you now see the Component Selection page. The Component Selection page allows you to select which Nsure Audit components you want to install to the current server. If you did not select Novell Nsure Audit Starter Pack on the Components page, continue with [Section 2.25, “NetStorage Install,” on page 66](#).

- 1 (Optional) Select the *Install Secure Logging Server* check box.

This installs the Secure Logging Server (`lengine.nlm`), `mdb.nlm`, and the channel drivers (`lgd*.nlm`) to the current server.

This also creates a Logging Server object in the Logging Services container.

- 2 (Optional) Select the *Autoconfigure MySQL* check box.

This creates the MySQL Channel object in the Logging Services' Channel container.

- 3 (Optional) Select the *Install Platform Agent* check box.

This installs the Platform Agent (`logevent.nlm`), the Caching Module (`lcache.nlm`), and the NetWare and eDirectory instrumentations (`auditNW.nlm` and `auditDS.nlm` respectively).

- 4 Specify the IP address or hostname of the Secure Logging Server that the Platform Agent will connect to.

- 5 Click *Next*.

## 2.24 Novell Nsure Audit Starter Pack - Database Options

If you selected the Autoconfigure MySQL check box in [Section 2.23, “Novell Nsure Audit Starter Pack - Component Selection,”](#) on page 65, the Database Options page displays. The options on this page are used to define the MySQL Channel object. If you did not check the Autoconfigure MySQL check box on the previous page, continue with [Section 2.25, “NetStorage Install,”](#) on page 66.

- 1 Type the IP Address or hostname of the MySQL database server in the field provided.

If a hostname is specified, only the first address associated with that name is used.

- 2 Type the MySQL port number where the Secure Logging Server will connect to the database server in the field provided.

If this field is left blank, the Secure Logging Server uses the default MySQL port assignment, 3306.

- 3 In the field provided, type the user account name that the Secure Logging Server uses to log in to the database.

This account has all privileges to the default database and can log in from any IP address.

The default username for the NetWare data store is `auditusr`.

---

**IMPORTANT:** On NetWare, MySQL installs in Secure Mode. In Secure Mode, the default MySQL administrative account, `Root`, only has rights to log in at the database server. Therefore, if you want the logging server to use the `Root` account to log in to the database, MySQL and the Secure Logging Server must be located on the same server and you must specify a loopback address (“`127.0.0.1`” or “`localhost`”) in the MySQL Database Host field.

---

- 4 Type the password the logging server uses to authenticate with the database in the field provided.

The default password for the OES NetWare data store is `auditpwd`.

- 5 Type the password again in the password confirmation field.

- 6 In the field provided, type the name of the database to which the logging server writes events.

The default database name is `naudit`.

The MySQL driver, `lgdmsql.nlm`, automatically creates this database when the logging server first loads the MySQL Channel object configuration in memory.

- 7 Type the database table name to which the logging server writes events in the field provided.

The default table is `log`.

The MySQL driver, `lgdmsql.nlm`, automatically creates this table when the logging server first loads the MySQL Channel object configuration in memory.

- 8 Click *Next*.

## 2.25 NetStorage Install

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. If you did not select Novell NetStorage on the Components page, continue with [Section 2.26, “Completing the Server Installation,”](#) on page 67.

- 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 specified, will allow NetStorage users to access and manipulate files and directories on the iFolder server.

- 4 Click *Next*.

## 2.26 Completing the Server Installation

After the installation is finished, remove *NetWare 6.5 SP5 CD 2 (Products)* and click *Yes* to restart the server.

If you selected to load the server on reboot, the NetWare server software will automatically load 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.

### NetWare Installation with 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 pre-existing volumes, then create an eDirectory object for each volume.

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

- 1 Launch iManager on your workstation.
- 2 In the left-hand navigation frame, click the Plus sign (+) next to the Storage heading.
- 3 Click the *Volumes* link under the Storage heading.

The existing volumes for the server are displayed in the Volume Management frame of the iManager screen.

- 4 Select the volume you want to create an eDirectory object for.

- 5 Click the *Mount* link in the Volume Management frame of iManager.
- 6 Click the *Update eDirectory* link in the Volume Management frame of iManager.

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

- 1 Enter `load 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 using NetWare Remote Manager:

- 1 Launch NetWare Remote Manager on your workstation.
- 2 In the left navigation frame, click the *Partition Disks* link under the Manage Server heading.
- 3 In the right frame of the browser window, locate the volume you want to create.
- 4 Click the *Create eDir Object* link next to the desired volume.

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

## 2.27 What's Next

After rebooting the server, continue by completing the tasks described in [Chapter 4, "Installing Products and Updates,"](#) on page 81.

The OES NetWare Welcome screen provides helpful information for getting the most out of your new NetWare server. To access the Welcome screen, open a browser on a workstation with access to the new server and go to `http://xxx.xxx.xxx.xxx`, where `xxx.xxx.xxx.xxx` is the new server's IP address.

---

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

---

For further information on the management of your server's operating system, see the *Server Operating System for NetWare Administration Guide for OES*. For information on managing your network using Novell iManager, see the *Novell iManager 2.5 Administration Guide*.

# Upgrading to OES NetWare

# 3

Novell® Open Enterprise Server (OES) NetWare® supports upgrades from previous versions of NetWare 5 and 6.

Upgrading a server to OES NetWare includes the following tasks:

- “Meeting System Requirements” on page 69
- “Preparing the Network with Deployment Manager” on page 71
- “Preparing the Computer” on page 71
- “Starting an Upgrade” on page 73
- “Completing the Server Upgrade” on page 78

When you run the upgrade program, the server is upgraded to OES NetWare and the following tasks are automatically performed:

- Device drivers and LAN drivers for the OES 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.

Upgrades to OES NetWare are performed on a running NetWare server.

---

**IMPORTANT:** If prompted to overwrite newer files due to patches or more recent Support Packs, Novell recommends overwriting newer files when performing major OS upgrades.

---

## 3.1 Meeting System Requirements

To upgrade to OES NetWare, your system must meet the minimum software and hardware requirements listed below.

### 3.1.1 Software Requirements

❑ The server to be upgraded must be running one of the following:

- NetWare 5.1 server 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, providing that Deployment Manager is first run to prepare the network for the new OES NetWare server.

- NetWare 6.0 server with Support Pack 5 or later
- NetWare 6.5 (FCS, Support Pack 1.1, Support Pack 2, Support Pack 3, or Support Pack 4)

- 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 using the NetWare installation files copied to another NetWare server running IP, you need the IP Server Connection Utility.

### 3.1.2 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 of at least 200 MB and 200 MB 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)

### 3.1.3 NetWare Installation CDs

The upgrade procedures described in this manual assume you are upgrading to OES NetWare. The process is essentially the same as upgrading to NetWare 6.5 Support Pack 5 and uses the same CD set.

Download the SP5 Operating System and Products CD overlay images. For instructions, see “[Getting and Preparing OES Software](#)” in the *Novell OES SP2 Planning and Implementation Guide*.

Use third-party CD burning software to create the installation CDs for use when upgrading to OES NetWare.

#### 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 eDirectory tree. The Admin user that is created during the OES NetWare Install program will have 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 would 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 could then install or upgrade subsequent OES NetWare servers without having to worry 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 will 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.

## 3.2 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 1.4, “Prepare the Network with Deployment Manager,” on page 18](#).

## 3.3 Preparing the Computer

To prepare your existing server for the NetWare operating system, complete the following tasks:

- [Section 3.3.1, “Back Up the NetWare Server Files,” on page 72](#)
- [Section 3.3.2, “Log Out Users Prior to Upgrading,” on page 72](#)
- [Section 3.3.3, “Prepare Application Files Prior to Upgrading,” on page 72](#)
- [Section 3.3.4, “Verify a Valid DOS Partition,” on page 72](#)
- [Section 3.3.5, “Locate NetWare License Files,” on page 72](#)

### 3.3.1 Back Up the NetWare Server Files

Make at least one backup of your NetWare server files, including files on the DOS partition. Do not attempt an upgrade without a backup.

### 3.3.2 Log Out Users Prior to Upgrading

It is recommended that you log all users off the server before upgrading it.

### 3.3.3 Prepare Application Files Prior to Upgrading

Some applications require that you perform certain actions prior to upgrading.

#### Preparing Servers Running ZENworks for Server 2 (Conditional)

If the server is running ZENworks<sup>®</sup> 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.

### 3.3.4 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 29](#).

---

**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).

---

### 3.3.5 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 the original release to SP4) and you have upgrade protection or maintenance on your NetWare 6.5 licenses, you can continue to use the existing license files. If you want to increase the number of users on your network, or if you do not have an upgrade protection or maintenance agreement for NetWare, you must purchase new OES licenses. 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.

## 3.4 Starting an Upgrade

The following sections explain how to start in-place and remote upgrades.

### 3.4.1 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 SP5 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*.

Proceed to [“Accepting the License Agreements” on page 75](#).

## 3.4.2 Remote Upgrades

One of the features in OES 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:

- Remote Upgrade from iManager
- Remote Upgrade from the Novell Deployment Manager

---

**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

Novell iManager 2.5 must be installed and configured in order for remote upgrades to successfully complete using this utility. For information on installation and configuration of iManage, see the *Novell iManager 2.5 Administration Guide*. After iManager is installed and configured, complete the following tasks:

- 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 SP5 CD 1 (Operating System)* or the OES NetWare installation files that have been copied to a network server.

---

**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.

---

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 Follow the on-screen instructions to complete the remote upgrade.

See “[Accepting the License Agreements](#)” on page 75.

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

- 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 SP5 CD 1 (Operating System)* or map a drive to a server containing the OES NetWare installation files.

---

**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.

---

- 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 Follow the on-screen instructions to complete the remote upgrade. See “[Accepting the License Agreements](#)” on page 75.

### 3.4.3 Accepting the License Agreements

Accepting both license agreements means that you have read and agreed to the terms and conditions contained in the license agreements.

- 1 For an upgrade, click *I Accept* for both license agreements.

### 3.4.4 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 76.

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*.

### 3.4.5 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*.

### 3.4.6 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 checked reinstalls the products. Unchecking 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 selecting 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*.

(Conditional, if installing from CD) When prompted, remove *NetWare 6.5 SP5 CD 1 (Operating System)*, insert *NetWare 6.5 SP5 CD 2 (Products)*, then click *OK*.

---

**IMPORTANT:** The iManager installation might take up to 15 minutes to complete. During this installation, the page will not change.

---

- 2 If you see a message stating that there is a file conflict, select the file overwrite option that you prefer and click *OK*.

The system proceeds to copy files for a few minutes, and then reboots.

If you selected Manual during [Step 4 on page 76](#), then your 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*.
- 2 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.

If you selected Default during [Step 4 on page 76](#), 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.

- 1 Type your name and password in the fields provided.
- 2 Click *OK*.

### 3.4.7 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*.

### 3.4.8 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 (NMAS) 2.3 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*.

---

**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.

---

## 3.5 Completing the Server Upgrade

After the upgrade is finished, remove *NetWare 6.5 SP5 CD 2 (Products)* and click *Yes* to restart the server.

If you selected to load the server on reboot, the NetWare server software will automatically load 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`.

Continue with [Section 2.27, “What’s Next,” on page 68](#).

## 3.6 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 Technical Services 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 \(page 75\)](#) step completes.
- After the failure, the upgrade cannot be restarted.

If you need to complete an upgrade on a downed server, contact Novell Technical Services for assistance.

## 3.7 What's Next

After rebooting the server, continue by completing the tasks described in [Chapter 4, “Installing Products and Updates,” on page 81](#).

The OES NetWare Welcome screen provides helpful information for getting the most out of your new NetWare server. To access the Welcome screen, open a browser on a workstation with access to the new server and go to `http://xxx.xxx.xxx.xxx`, where `xxx.xxx.xxx.xxx` is the new server's IP address.

---

**IMPORTANT:** Apache and Tomcat must be installed on the server in order for the Welcome screen to be displayed. If you have not installed these two components on your server, you will not see the Welcome screen.

---





# Installing Products and Updates

# 4

After installing or upgrading to Novell® Open Enterprise Server (OES) NetWare®, 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 chapter covers the following post-installation tasks:

- Section 4.1, “Installing NetWare Licenses,” on page 81
- Section 4.2, “Updating NSS Volumes,” on page 81
- Section 4.3, “Installing or Updating Novell Client Software,” on page 82
- Section 4.4, “Installing Product Updates,” on page 82
- Section 4.5, “Installing Additional Products,” on page 82
- Section 4.6, “Deploying eDirectory 8.8,” on page 83
- Section 4.7, “Other Post-Installation Tasks,” on page 83

## 4.1 Installing NetWare Licenses

If you installed your server with no license, you must install either the 90-day evaluation license or a standard purchased license before using the server.

If you installed the evaluation license and the 90-day evaluation period has elapsed, Novell expects you to purchase a standard user license if you intend to continue using the server. Contact your Novell Authorized Reseller<sup>SM</sup> for more information.

Use Novell iManager to install NetWare licenses. For information about accessing the iManager utility, see “[Accessing iManager](#)” in the *Novell iManager 2.5 Administration Guide*.

- 1 (Conditional) If necessary, delete an existing evaluation license.
  - 1a In iManager, click *Licenses > Delete a License*.
  - 1b Browse to the evaluation license, then click *OK*.
  - 1c When prompted, confirm that you want to delete the license container and its certificates by clicking *OK*.
  - 1d When you see the message verifying that the license has been deleted, click *OK*.
- 2 To install a new NetWare license, in iManager, click *Licenses > Install a License*.
- 3 Browse to the location of the `.nlf` file, 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*.

## 4.2 Updating NSS Volumes

If you upgraded from a NetWare 5.1 server with NSS volumes, you must complete the following procedure to update NSS volumes.

---

**NOTE:** For more detailed information, see “[Upgrading Legacy NSS and NetWare Traditional Volumes](#)” in the *Novell Storage Services File System Administration Guide for OES*.

---

- 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 NetWare server.

## 4.3 Installing or Updating Novell Client Software

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

For more information, see the [Novell Client online documentation \(http://www.novell.com/documentation/noclienu\)](http://www.novell.com/documentation/noclienu).

## 4.4 Installing Product Updates

For best performance, you should download and install the latest product updates available at [Novell Support and Downloads \(http://support.novell.com\)](http://support.novell.com).

## 4.5 Installing Additional Products

You can now install other networking products on your OES NetWare server. For specific product information, see the product documentation in the [Open Enterprise Server online documentation \(http://www.novell.com/documentation/oes\)](http://www.novell.com/documentation/oes).

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 using Novell Deployment Manager (remotely) or from the GUI server console page (locally).

---

**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 SP5, you must use the SP5 overlay CDs.

---

### Installing Additional Products Using Deployment Manager

- 1 Log in to the network from a Windows workstation running Novell Client software.
- 2 Run `nwdeploy.exe` (or `nwdeploynobrowser.exe` for the non-browser version), located at the root of *NetWare 6.5 SP5 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.

## Installing Additional Products Using the GUI Server Console Page

- 1 Insert *NetWare 6.5 SP5 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.

## 4.6 Deploying eDirectory 8.8

The OES NetWare installation program installs eDirectory 8.7.3. If you want to deploy eDirectory 8.8 on a NetWare network, you must first upgrade the servers to OES SP2 and then perform the eDirectory update as an add-on product installation. For more information, see “[Installing or Upgrading Novell eDirectory on NetWare](#)” in the *Novell eDirectory 8.8 Installation Guide*.

See [TID 10100450](http://support.novell.com/cgi-bin/search/searchtid.cgi?10100450.htm) (<http://support.novell.com/cgi-bin/search/searchtid.cgi?10100450.htm>) for known issues involving eDirectory 8.8 support in OES SP2.

## 4.7 Other Post-Installation Tasks

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

- Creating additional volumes
- Consolidating or migrating servers using the Novell Server Consolidation and Migration Toolkit
- Using DSREPAIR
- Upgrading a cluster after the NetWare installation



# Installing OES NetWare on VMware

# 5

Novell® Open Enterprise Server (OES) for NetWare® can be installed as a guest operating system in a VMware\* Virtual Machine.

This chapter provides information and guidelines for installers who are planning to install OES NetWare (NetWare 6.5 SP5) on VMware.

## 5.1 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

### 5.1.1 VMware Product Versions

VMware offers two versions of its virtual infrastructure software that are recommended for use with OES 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.

## 5.1.2 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<sup>®</sup> LINUX Enterprise Server (SLES) 8 or 9. 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 OES NetWare and SLES 9.

For more information about VMware, see the [VMware Web site \(http://www.vmware.com\)](http://www.vmware.com).

## 5.2 Installation Guidelines for OES NetWare

This section provides guidelines specific to installing OES NetWare (NetWare 6.5 SP4) 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 5.2.1, “Selecting Suitable Hardware,” on page 86](#)
- [Section 5.2.2, “Installing the VMware Software,” on page 87](#)
- [Section 5.2.3, “Creating a New Virtual Machine,” on page 87](#)
- [Section 5.2.4, “Installing OES NetWare as the Guest Operating System,” on page 88](#)
- [Section 5.2.5, “Installing VMware Tools for NetWare,” on page 88](#)
- [Section 5.2.6, “Additional Information,” on page 89](#)

### 5.2.1 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 \(http://www.vmware.com/support/resources\)](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.

---

## 5.2.2 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.

## 5.2.3 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 OES 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.

---

## 5.2.4 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 SP5 CD 1 (Operating System)* into the CD-ROM drive of the VMware server.
- 4 Boot the virtual server from the CD, 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 2, "Installing OES NetWare,"](#) on page 27.

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 SP5 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.

## 5.2.5 Installing VMware Tools for NetWare

After you have installed OES NetWare, install VMware Tools for NetWare. Follow the instructions in the [VMware Knowledge Base \(http://www.vmware.com/support/kb/enduser/std\\_adp.php?p\\_faqid=340\)](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.

## 5.2.6 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)
- [Rob's Guide to Using VMware \(http://www.books4brains.com/catalog.htm\)](http://www.books4brains.com/catalog.htm)



# Keyboard Commands

# A

Although a mouse is recommended, you can use the keyboard commands in [Table A-1](#) to navigate through 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 A-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
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



# Documentation Updates

# B

This section contains information on documentation content changes that have been made in the *OES for NetWare Installation Guide* since the initial release of the product. This information will help you to keep current on updates to the documentation.

All changes that are noted in this section were also made in the documentation. The documentation is provided on the Web in two formats: HTML and PDF. The HTML and PDF documentation are both kept up-to-date with the documentation changes listed in this section.

The documentation update information is grouped according to the date the changes were published. Within a dated section, the changes are alphabetically listed by the names of the main table of contents sections for OES NetWare®.

If you need to know whether a copy of the PDF documentation you are using is the most recent, the PDF document contains the date it was published on the front title page or in the Legal Notices section immediately following the title page.

The documentation was updated on the following dates:

- “May 25, 2006” on page 93
- “March 3, 2006” on page 93
- “December 23, 2005 (OES Support Pack 2)” on page 93
- “September 29, 2005” on page 93
- “August 19, 2005 (OES Support Pack 1)” on page 94
- “June 1, 2005” on page 95

## B.1 May 25, 2006

Added information about the Virtual Office 1.6.1 for NetWare update that is available as a separate download. See [Section 1.1, “Understand the Install/Upgrade Options for OES NetWare,” on page 11](#) for more information.

## B.2 March 3, 2006

Added a section on [Deploying eDirectory 8.8](#) to [Chapter 4, “Installing Products and Updates,” on page 81](#).

## B.3 December 23, 2005 (OES Support Pack 2)

Updated version references, corrected minor errors, and reformatted the page design to comply with revised Novell® documentation standards.

## B.4 September 29, 2005

Updates were made to the following sections. The changes are explained below.

- [Preparing to Install or Upgrade to OES for NetWare](#)

- [Installing OES NetWare on VMware](#)

## B.4.1 Preparing to Install or Upgrade to OES for NetWare

The following updates were made in this section:

Location	Change
<a href="#">Section 1.1, "Understand the Install/Upgrade Options for OES NetWare," on page 11</a>	Added information about installing OES NetWare on VMware.

## B.4.2 Installing OES NetWare on VMware

Added this new section on installing OES NetWare on a VMware Virtual Server.

## B.5 August 19, 2005 (OES Support Pack 1)

Updates were made to the following sections. The changes are explained below.

- [Preparing to Install or Upgrade to OES for NetWare](#)
- [Installing OES for NetWare](#)

### B.5.1 Preparing to Install or Upgrade to OES for NetWare

The following updates were made in this section:

Location	Change
<a href="#">Section 1.1, "Understand the Install/Upgrade Options for OES NetWare," on page 11</a>	Updated version references and removed information about blade server installation and the differences between OES NetWare and NetWare 6.5 support pack installations.
<a href="#">Section 1.4, "Prepare the Network with Deployment Manager," on page 18</a>	Changed references to migration and consolidation options to reflect the new combined option for the Server Consolidation and Migration Toolkit.

### B.5.2 Installing OES for NetWare

The following updates were made in this section:

Location	Change
<a href="#">"Installing OES NetWare" on page 27</a>	Removed section on selecting the OES vs. NetWare 6.5 support pack installation options.

Location	Change
Section 2.6, “Choosing a Server Pattern,” on page 36	Updated version numbers for server components.

## B.6 June 1, 2005

Updates were made to the following sections. The changes are explained below.

- Section B.6.1, “Installing OES for NetWare,” on page 95
- Section B.6.2, “Installing Products and Updates,” on page 95

### B.6.1 Installing OES for NetWare

The following updates were made in this section:

Location	Change
Section 2.6, “Choosing a Server Pattern,” on page 36	Added information about the OpenWBEM components that are installed by default on OES NetWare servers.
Section 2.15, “Licensing the NetWare Server,” on page 61	Added information about the 90-day evaluation license and purchased server licenses for OES NetWare.

### B.6.2 Installing Products and Updates

The following updates were made in this section:

Location	Change
Section 4.1, “Installing NetWare Licenses,” on page 81	Added this new section to explain how to install purchased OES NetWare server licenses with iManager.