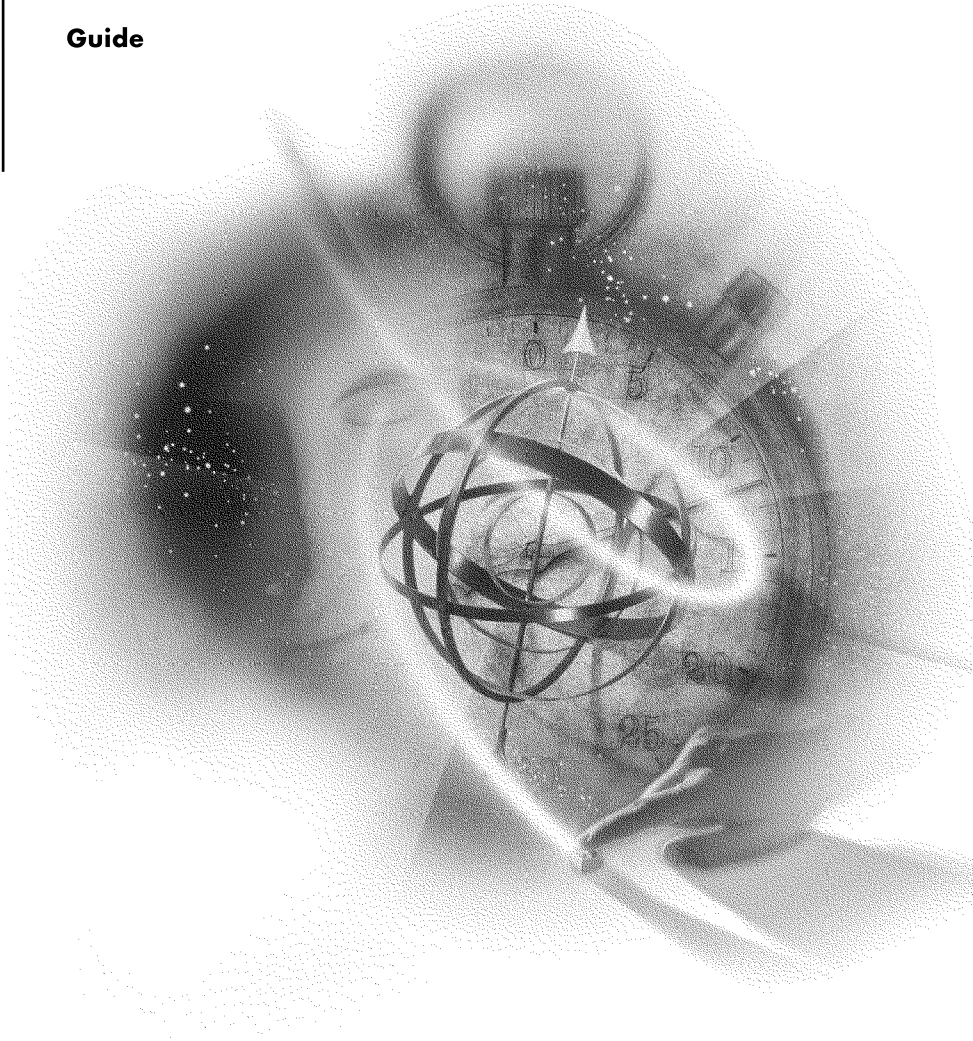


**Installation**

**Guide**



**NetWare<sup>®</sup> 5.1**  
NETWORKING SOFTWARE

**Novell<sup>®</sup>**

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Installation Guide  
January 2000

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# Welcome to NetWare 5.1

NetWare<sup>®</sup> 5.1 is the number one server platform for your network and your Internet-enabled business.

NetWare 5.1 turns a server-class PC into a high-performance network server, providing connectivity among personal computers, printers, mass storage devices, and the Internet.

NetWare 5.1 gives you superior management and control of your entire network and Internet servers, by offering the following key advantages:

- ◆ A fast, reliable, and manageable networking platform for both network and Internet-enabled applications, including one of the fastest and most reliable Java<sup>\*</sup> Virtual Machines (JVMs) for running Java applications.
- ◆ Support for Hypertext Transfer Protocol (HTTP), the protocol that Web servers and Web browsers use to communicate on the Internet—and now on the local network too.
- ◆ Full-service Directory capabilities of NDS<sup>®</sup> 8 and native support for LDAP v3, the protocol that allows customers to access Directory information from many different locations.
- ◆ NDS management tools that help you set up, configure, and manage your network and Internet resources.

Whether your network has a single NetWare 5.1 server or hundreds of NetWare, NT, and UNIX<sup>\*</sup> servers located on local sites, at sites around the world, or on the Internet, NetWare 5.1 is what you need.

NOTE: For descriptions of some of the key products and services that are included with NetWare 5.1, see [“Install Networking Products” on page 105](#).

# Installation and Upgrade Options

Several options are available for installing or upgrading to NetWare 5.1. If you have specific tasks in mind as you begin to use NetWare 5.1, refer to the following chart for references to relevant documentation.

NOTE: NetWare 5.1 online documentation and any relevant corrections or updates are also available at the [Novell Product Documentation Web site \(http://www.novell.com/documentation\)](http://www.novell.com/documentation).

<b>If you want to</b>	<b>Refer to</b>
Add a NetWare 5.1 server to an existing network	Chapter 1, "Install a NetWare 5.1 Server," on page 13
Upgrade an existing NetWare 3, NetWare 4, or NetWare 5 server	Chapter 2, "Upgrade a NetWare Server to NetWare 5.1," on page 57
Transfer data from an existing NetWare server to a new NetWare 5.1 server	Chapter 3, "Using Novell Upgrade Wizard," on page 63
Install or upgrade workstations to the latest Novell® Client™ software	Chapter 4, "Install Novell Clients," on page 89
Install additional networking products and services	Chapter 5, "Install Networking Products," on page 105
Upgrade using other installation options	NetWare 5.1 Online Documentation CD

# User Comments

We want to hear your comments and suggestions about this manual and the other documentation included with NetWare 5.1.

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# 1

## Install a NetWare 5.1 Server

This chapter describes how to install a NetWare<sup>®</sup> 5.1 server. The installation process includes the following tasks:

- ♦ Meet system and software requirements
- ♦ Prepare the network and the computer
- ♦ Specify hardware and software settings
- ♦ Create a NetWare partition and volume SYS
- ♦ Name the server and install the server file system
- ♦ Install networking protocols
- ♦ Set up NDS<sup>®</sup>, the Novell<sup>®</sup> directory technology
- ♦ Install other networking products

# Meet System and Software Requirements

## System Requirements

NetWare 5.1 has the following minimum system requirements:

- A server-class PC with a Pentium\* or higher processor.
- A VGA or higher resolution display adapter (SVGA recommended).
- A DOS partition of at least 50 MB with 35 MB available space.
- Minimum disk space requirement outside the DOS partition:
  - ◆ Standard NetWare products plus WebSphere\* Application Server for NetWare—1.3 GB for volume SYS.
- Minimum memory requirements:
  - ◆ Standard NetWare products—128 MB.
  - ◆ NetWare products plus WebSphere Application Server for NetWare—256 MB (512 MB recommended).
  - ◆ All products including Oracle8—512 MB.
- One or more network boards.
- A CD drive. Bootable CD drives must support the El Torito specification.
- A PS/2\* or serial mouse is recommended, but not required.

NOTE: The system requirements listed above are minimum requirements. You can optimize the server performance by increasing the amount of server memory, disk space, and processor speed.

## Software and Other Requirements

Before installing, make sure that you have the following software and information:

- If this is the *first* NetWare 5.1 server on the network, you must:

- ◆ Make sure that this server will be a reliable, accessible, and continuing part of your network.

NOTE: The first NetWare 5.1 server will automatically create and physically store the Organizational Certificate Authority (CA) object for the entire NDS tree. The Organizational CA object enables secure data transmissions and is required for Web-related products such as NetWare Web Manager and NetWare Enterprise Web Server.

IMPORTANT: Once the Organizational CA object is created, you should not delete or move it.

- ◆ Have Supervisor rights at the [Root] of the NDS tree.

- If this is *not* the first NetWare 5.1 server on the network, you must:

- ◆ Have Supervisor rights to the container where the server will be installed.
- ◆ Have Read rights to the Security container object for the NDS tree.

- NetWare 5.1 Operating System CD.

- NetWare 5.1 License/Cryptography diskette.

- DOS 3.3 or later. (DOS 7 is included on the NetWare 5.1 License/Cryptography diskette.)

NOTE: Do not use the version of DOS that ships with Windows\* 95, Windows 98, or Windows NT\* operating systems.

- DOS CD drivers.

- Client connection utilities (optional, for installing from a network):

- ◆ Novell Client™ for DOS and Windows 3.1x (optional, for installing from a NetWare server running IPX).
- ◆ IP Server Connection Utility (optional, for installing from a NetWare server running IP only). For instructions, see PRODUCTS\SERVERINST\IPCONN.TXT on the Novell Client CD.

- ❑ IP address and domain names (optional, for connecting to the Internet):
  - ◆ An IP address
  - ◆ An IP address of a Domain Name Server
  - ◆ The name of your domain

NOTE: For IP addresses and domain names, contact your system administrator and Internet Service Provider (ISP).

- ❑ Network board and storage device properties, such as the interrupt and port address. For more information, contact your computer hardware manufacturer.

Next, you should prepare the network for a NetWare 5.1 server. If this server is not being integrated into an existing network, you can skip to **“Prepare the Computer” on page 17.**

## Prepare the Network

Before you introduce a NetWare 5.1 server into an existing network that contains NetWare 4 servers, you must run NetWare Deployment Manager to update the network.

NOTE: A network consisting of only NetWare 3 servers does not need to be updated.

To update the network for NetWare 5.1, you must

- 1 Log in from a Windows 95/98 or Windows NT workstation to your existing network as a user with Supervisor rights.
- 2 Run NetWare Deployment Manager (NWDEPLOY.EXE), located on the NetWare 5.1 Operating System CD.
- 3 Complete the following tasks in the Network Preparation section:
  - 3a Back up NDS and server data.
  - 3b Update NDS.
  - 3c Prepare for NDS 8 (required if installing NetWare 5.1 with NDS 8).
  - 3d Install or update Novell Licensing Services.

After you have completed the Network Preparation section of NetWare Deployment Manager, you should now prepare the computer to be a NetWare server.



# Prepare the Computer

To prepare your computer for NetWare 5.1, you must

- ◆ Install computer and networking hardware
- ◆ Create and format a DOS partition
- ◆ Access the installation files

## Install 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 storage adapters.

## Create and Format a DOS Partition

NetWare requires a DOS partition with available disk space of at least 35 MB to start the computer and load NetWare. The DOS partition contains the NetWare startup and server files.

NOTE: You should increase the size of your DOS partition to accommodate your specific configuration requirements.

To create and format a DOS partition, complete the following steps.

- 1 Back up any desired data to another computer or off-line storage media.
- 2 If the computer already has an operating system installed, such as Windows, you should completely remove the partitions and the operating system.

NOTE: Use FDISK to remove partitions.

- 3 Boot your computer with DOS 3.3 or later.

NOTE: You can boot from the NetWare 5.1 License/Cryptography diskette. DOS 7 and all required DOS utilities are included on the diskette. Do not use the version of DOS that ships with Windows 95, Windows 98, or Windows NT operating systems.

- 4 Use FDISK to create a 50 MB active DOS partition by entering **FDISK**. (Create a primary DOS partition, and make it the active partition.)

The computer will restart.

- 5 Format and transfer DOS system files to the partition by changing to drive A: and entering **FORMAT C: /S**.

Your computer should now have an active DOS partition of at least 50 MB. Continue the installation by accessing the installation files.

## Access the Installation Files

NetWare 5.1 can be installed from the server's local CD drive or from installation files located on the network. To access the NetWare 5.1 installation files, complete the following steps.

NOTE: If you are using a bootable CD, skip to ["Navigating in the Character-Based Screens" on page 19](#).

- 1 Install the DOS CD driver for your CD drive onto the DOS partition. DOS CD drivers are provided by the CD drive manufacturer.

NOTE: Make sure that the logical filename of your CD drive (specified in the CONFIG.SYS and AUTOEXEC.BAT files) is *not* CDROM or CDINST.

- 2 Make sure that the CONFIG.SYS file contains the following commands:  
**FILES=40** and **BUFFERS=30**.
- 3 (Conditional) If you are installing from files located on a network, install the Novell Client for DOS and Windows 3.1x or IP Server Connection Utility software located on the Novell Client CD.

After accessing the files for the installation program, you can begin the installation.

# Begin the Installation

To begin the installation, complete the following steps.

- 1 Insert the NetWare 5.1 CD, or log in to the network and access the installation files on the network.
- 2 At the CD drive or network drive prompt, enter **INSTALL**.

## 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.

**HINT:** To continue the installation with the standard settings: Use the arrow keys to highlight Continue in the Options box. Press Enter.

To modify the settings: Use the arrow keys to highlight Modify in the Options box. Press Enter. Highlight the field to be modified. 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.

## Select the Type of Installation and Regional Settings

To select the type of installation and select regional settings, you must

- ◆ Select the language and accept the License Agreement
- ◆ Select the type of installation
- ◆ Specify server settings
- ◆ Select the regional settings
- ◆ Select the mouse and video type

## Select the Language and Accept the License Agreement

The installation program is available in several languages. You can install other language options, such as the language for the operating system or for users, later during the installation program.

Accepting the License Agreement means that you have read and you accept terms and conditions contained in the License Agreement.

HINT: Press F10 to accept the License Agreement.

## Select the Type of Installation

You can install NetWare on a new computer or you can upgrade an existing computer running NetWare 3, NetWare 4, or NetWare 5.

NetWare Installation

Welcome to the NetWare server installation.

Select the type of installation. A new installation will destroy existing data on NetWare partitions. To keep data, select Upgrade.

**IMPORTANT:** You must run NetWare Deployment Manager before installing into an existing network. If you have not, insert the NetWare 5 CD into a Windows workstation and run NWDEPLOY.EXE.

Use the Tab or arrow keys to move between windows.

Is this a new server or an upgrade? **Upgrade**

Startup directory C:\NWSEVER

Options

Continue  
Modify

Alt+F10=Exit Enter=Select/View F1=Help

HINT: To select the type of installation: In the Options box, select Modify > Type of Installation > New Server. Return to the Options box to continue.

- ♦ **New Server**—installs a new server. Creates a new NetWare partition but will not delete system partitions or other partitions such as DOS, UNIX\*, or Windows.

NOTE: If the computer already has a NetWare partition, the new server installation will delete the NetWare partition containing volume SYS, and any other volumes that are part of that NetWare partition. If you want to keep volumes that are part of that NetWare partition, select Upgrade.

- ◆ **Upgrade**—If you are upgrading an existing server from a previous version of NetWare, select Upgrade. Upgrading retains all your server data such as files, directory structures, partitions, and volumes.

NOTE: During an upgrade, the upgrade program may skip entire sections of this chapter. The upgrade program detects and automatically configures several of the tasks required to set up the server.

- ◆ **Startup Directory**—The startup directory is the directory on the DOS partition that contains the files to launch the NetWare server.

## Specify Server Settings

You can change the following default server settings for your networking environment.

- ◆ **NDS Version**—NetWare 5.1 allows you to install either NDS 8 or NDS 7.
  - ◆ **NDS 8**—Provides the enhanced NDS functionality required by many new Web networking products, such as WebSphere. If your NDS tree has not already been updated for NDS 8, you must have Supervisor rights at the root of the NDS tree to install NDS.
  - ◆ **NDS 7**—Provides basic NDS functionality without the requirement of modifying the NDS partition at the root of the NDS tree. Install NDS 7 if you do not have Supervisor rights at the root of the NDS tree or if the NDS tree has not already been modified for NDS 8.

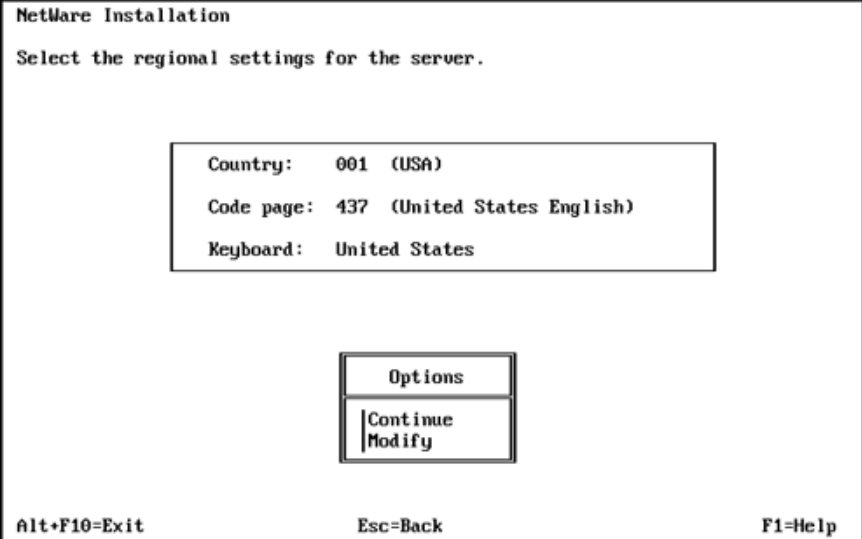
NOTE: Products that require NDS 8 will not be installed if you install NDS 7.

- ◆ **Server ID Number**—A unique server identification number (up to eight hexadecimal digits) identifies the server on the network. The server ID number functions like an internal IPX™ number. Although a server ID number is created automatically, you might need to enter a specific server ID number if you are installing in either of the following conditions:
  - ◆ **Filtered environment**—Routers between network segments can be configured to forward data only from specific computer addresses. Data being sent from other computer addresses is not forwarded to other segments.

NOTE: If you are accessing the installation files from a server on a different network segment, you might not be able to reconnect to the server to complete the installation unless you specify an unfiltered server ID number.

- ♦ **Numbering scheme**—Some network administrators set up a predetermined numbering scheme to identify servers in particular locations or organizations. For example, all servers in building A might begin with 0101, and all servers in building B might begin with 0102.
- ♦ **Load Server at Reboot**—Select No if you do not want the AUTOEXEC.BAT and CONFIG.SYS files to contain the commands to automatically load the server operating system when the computer reboots. If you select Yes (default), the old AUTOEXEC.BAT and CONFIG.SYS files are renamed and saved with a .00x extension.
- ♦ **Server SET Parameters**—You might need to modify the SET parameters for some device drivers, such as for network boards and storage devices, in order to complete installation. SET parameters are saved to the STARTUP.NCF file.

## Select the Regional Settings



The image shows a text-based menu for selecting regional settings. At the top, it says "NetWare Installation" and "Select the regional settings for the server." Below this, a box contains the following information: "Country: 001 (USA)", "Code page: 437 (United States English)", and "Keyboard: United States". At the bottom of the screen, there are three keyboard shortcuts: "Alt+F10=Exit", "Esc=Back", and "F1=Help".

```
NetWare Installation
Select the regional settings for the server.

Country: 001 (USA)
Code page: 437 (United States English)
Keyboard: United States

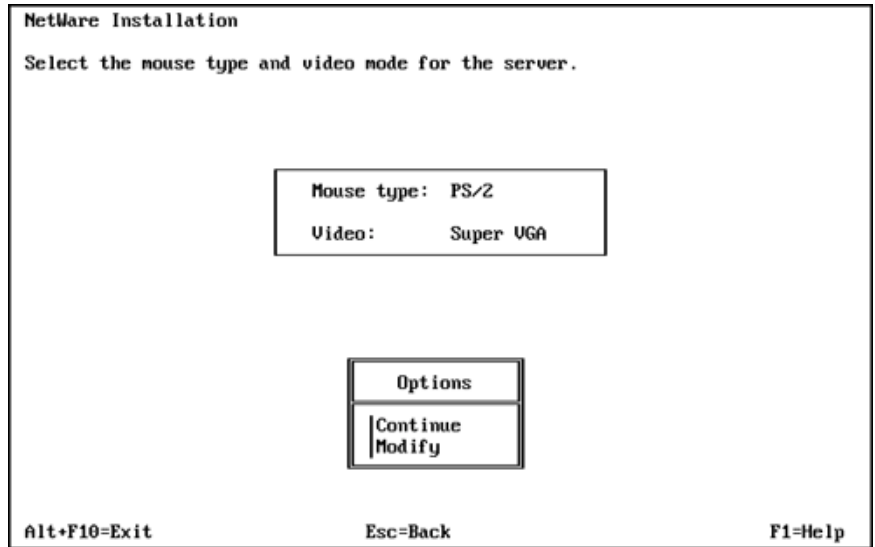
Options
Continue
Modify

Alt+F10=Exit      Esc=Back      F1=Help
```

Choose the country, code page, and keyboard mapping for your language and computer.

## Select the Mouse and Video Type

NOTE: The mouse type and video type are not auto-detected by the installation program. You must select the settings for the computer.

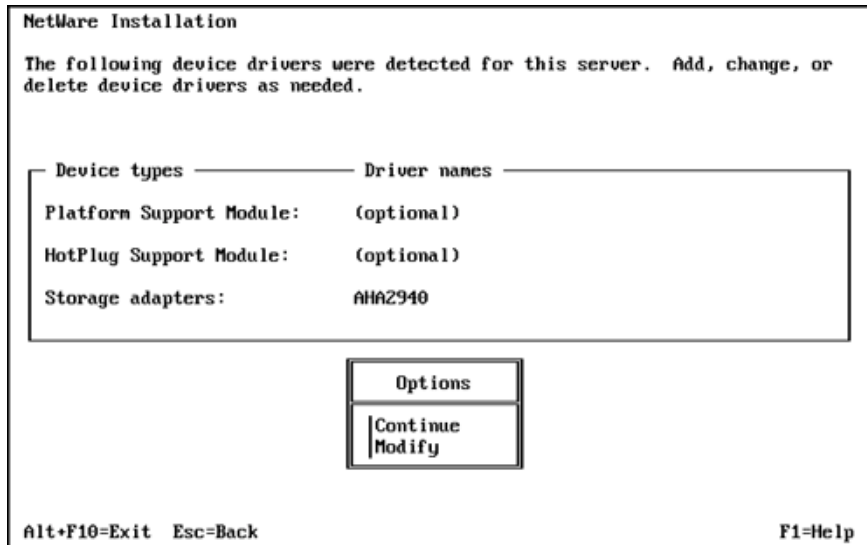


- ♦ **Mouse Type**—Choose a mouse type, if available on the computer. The installation program supports PS/2 or serial mouse types, but a mouse is not required.
- ♦ **Video Type**—The NetWare installation program is optimized to display with video display hardware that is VESA 2 compliant. Choose Standard VGA only if your video board does not support 256 colors.

# Select a Platform Support Module and Storage Adapter

To select a platform support module and storage adapter, you must

- ◆ Select a platform support module (if required)
- ◆ Select a PCI Hot Plug module (if required)
- ◆ Select and configure a storage adapter



**HINT:** To *add* a driver: In the Options box, select Modify. Select the driver and press Enter. Press Insert to select from a list of drivers provided with NetWare. Press Insert again to install a driver from diskette.

To *delete* a driver: In the Options box, select Modify. Select the driver and press Enter. Select the driver to delete and press Delete.

To *modify* a driver: In the Options box, select Modify. Select the driver and press Enter. Select the driver to modify and press Enter. Select the property to modify.

## Select a Platform Support Module (If Required)

A platform support module (PSM) provides increased performance for multi-processor computers and some specific hardware configurations. If a PSM driver is required, it will be auto-detected. If the installation program does not detect a PSM driver, your computer does not need one.



NOTE: If a PSM driver is detected on a computer without multiple processors, you can allow the driver to load without adversely affecting performance.

## Select a PCI Hot Plug Module (If Required)

Computers that support PCI Hot Plug technology allow storage adapters and network boards to be inserted and removed while the computer is on. If the installation program does not detect a PCI Hot Plug support module, your computer probably does not support the PCI Hot Plug technology.

## Select a Storage Adapter

A storage adapter is the adapter that plugs into the computer and provides a link between the computer and one or more storage devices. The storage adapter requires a software driver called a host adapter module (HAM) in order to communicate with the computer (host). Storage devices require a separate driver called a custom device module (CDM).

NOTE: .DSK drivers are no longer supported. Instead, NetWare uses the enhanced capability of NetWare Peripheral Architecture™ (NWPA). NWPA requires a HAM and a CDM.

Because a single adapter can control more than one type of storage device, your computer might require only a single HAM, even though it can have more than one type of storage device—and therefore multiple CDMs.

The installation program auto-detects many types of storage adapters, such as IDE and SCSI adapters. If your storage adapter is not detected, choose the appropriate driver from the list of available drivers provided with NetWare 5.1 or add a new driver from a diskette. You can obtain HAMs from the storage adapter manufacturer.

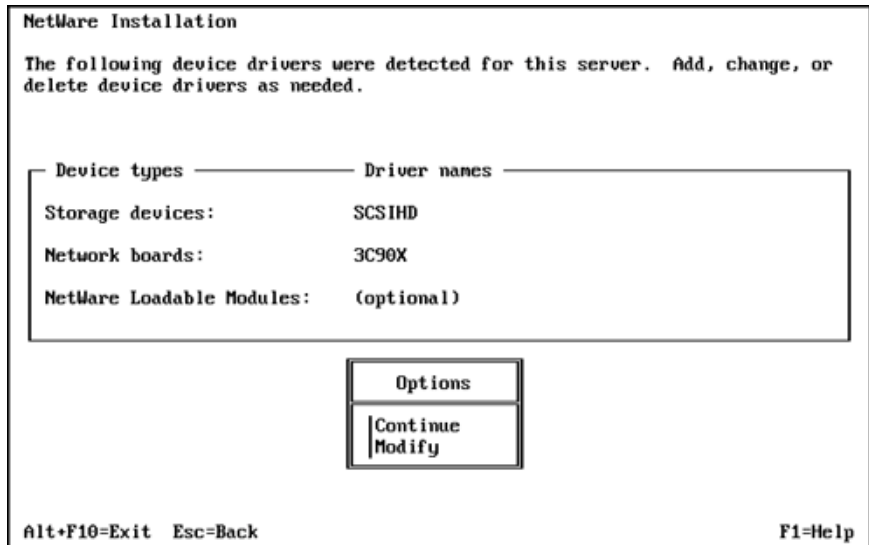
## Edit the Properties of the Storage Adapter (If Required)

The storage adapter must be installed and configured correctly. Properties such as interrupt, port value, and slot must not conflict with any other device in the computer. If you need specific storage adapter properties, contact the storage adapter manufacturer.

# Select a Storage Device and a Network Board

To select a storage device and network board, you must

- ◆ Select and configure the storage device
- ◆ Select and configure the network board
- ◆ Load a NetWare Loadable Module™ program (if required)



HINT: To *add* a driver: In the Options box, select Modify. Select the driver and press Enter. Press Insert to select from a list of drivers provided with NetWare. Press Insert again to install a driver from diskette.

To *delete* a driver: In the Options box, select Modify. Select the driver and press Enter. Select the driver to delete and press Delete.

To *modify* a driver: In the Options box, select Modify. Select the driver and press Enter. Select the driver to modify and press Enter. Select the property to modify.

## Select a Storage Device

Storage devices such as hard disks, CD drives, and tape devices require a software driver to communicate with the storage adapter. The software driver for the storage device is called a *custom device module* (CDM). Each type of storage device requires a CDM.

The installation program auto-detects many types of storage devices, such as IDE drives, SCSI drives, CD drives, and tape drives. If your storage device is not detected, choose the appropriate driver from the list of available drivers provided with NetWare 5.1 or add a new driver from a diskette. CDMs can be obtained from the storage device manufacturer.

## Select a Network Board

Network boards, such as the Novell NE3200™ board, require a software driver in order to communicate with the network. The software driver for a network board is called a *LAN driver*.

The installation program auto-detects many types of network boards. If your network board is not detected, choose the driver for the network board from the list provided with NetWare 5.1 or add a new driver from a diskette. You can obtain LAN drivers from the network board manufacturer.

## Edit the Properties of the Network Board (If Required)

The network board must be installed and configured correctly. Properties such as interrupt, port value, and slot must not conflict with any other device in the computer. If you need specific network board properties, contact the network board manufacturer.

## Load a NetWare Loadable Module (If Required)

Some server and network configurations require you to load a NetWare Loadable Module (NLM™) program before completing the server installation. For example, you can load ROUTE.NLM for installing in a token ring environment.

# Create a NetWare Partition and Volume SYS

Partitions correspond with operating systems, such as NetWare, DOS, or UNIX. Partitions divide a large storage region into smaller, more manageable sections. A single storage device can contain up to four partitions.

You can divide NetWare partitions into smaller sections called volumes. Each NetWare partition can contain up to eight volumes.

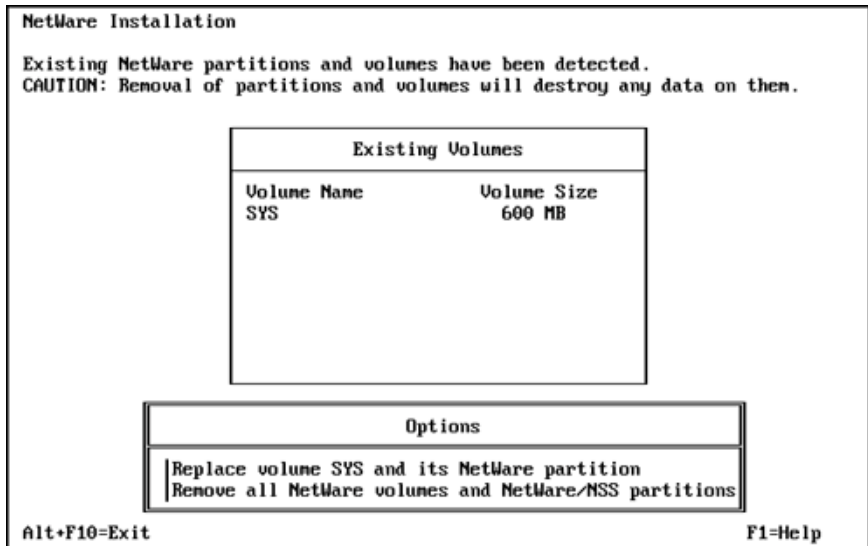
To create a NetWare partition and volume SYS, you must

- ◆ Remove an existing volume SYS (conditional)
- ◆ Create a NetWare partition
- ◆ Create volume SYS
- ◆ Set the size of the NetWare partition and volume SYS (if required)
- ◆ Modify the properties of volume SYS (if required)

## Remove an Existing Volume SYS (Conditional)

If your server already has a volume SYS, the volume and all its data will be deleted.

NOTE: To retain the data on volume SYS, you should exit and restart the installation program and select Upgrade from the Type of Installation screen.



When removing volume SYS during a new server installation, you must choose one of the following options:

- ◆ **Replace Volume SYS and its NetWare Partition**—This will remove the existing volume SYS, as well as the entire NetWare partition containing volume SYS. Any volume that is part of the NetWare partition that contains volume SYS is also removed—even if the volume spans to other NetWare partitions.
- ◆ **Remove All NetWare Volumes and NetWare/NSS Partitions**—This will remove all NetWare volumes and all NetWare/NSS partitions.

Either option will remove only NetWare partitions. Other types of partitions, such as DOS, UNIX, and system/utility partitions, will not be removed.

## Create a NetWare Partition

During the initial stages of installation, the installation program guides you through the steps to create a single NetWare partition containing volume SYS.

**NetWare Installation**

Create a NetWare partition and volume SYS.

Volume SYS and Partition Properties	
Device:	SEAGATE ST32550M rev:0019 [0312-A0-D0:0]
NetWare Partition Size (MB):	1019.8
Hot Fix Size (MB):	3.8
Volume SYS Size (MB):	1015.9

NOTE: Press F1 for size recommendations.  
For NSS partitions, leave unpartitioned space on a device.

Options
Continue
Modify

Alt+F10=ExitF1=Help

**NetWare Partition Size**—All available space on the storage device will be allocated to the NetWare partition, unless you change the size.

HINT: To modify the NetWare partition size: In the Options box select Modify. Select the appropriate storage device. Select NetWare Partition Size and press Enter. Backspace over the current size. Type the new size and press Enter. Press F10 to save the settings and continue.

NOTE: NSS volumes use disk space *outside* of the NetWare partition. If you want to create NSS volumes, remember to reduce the size of the NetWare partition so that the appropriate amount of disk space is available for NSS volumes.

## Hot Fix

Hot Fix™ is a NetWare data protection feature that is optimized for your storage device. Hot Fix maintains a list of defective areas on the storage device and redirects data from defective locations to safe locations.

If your storage devices include hardware redirection, you can turn off Hot Fix by setting the Hot Fix size to 0. For more information on hardware redirection, contact your storage device vendor.

## Create Volume SYS

The NetWare 5.1 operating system requires a volume of at least 750 MB named SYS. Although the NetWare operating system requires 750 MB, volume SYS must be large enough to accommodate all of the NetWare products that will be installed.

NOTE: Volume SYS must be a traditional volume. It cannot be an NSS volume.

**Table 1**    **Volume SYS Size**

NetWare 5.1 Products	Minimum Volume SYS Size
Standard NetWare 5.1 products	750 MB
All NetWare 5.1 products	1.3 GB

NOTE: In addition to the sizes in the table, you should add as much as 100 MB to the volume SYS size. For optimal performance, volume SYS should always have available space for system operations.

**Volume SYS size**—By default, volume SYS will use all available space on the NetWare partition.

HINT: To modify volume SYS size: In the Options box select Modify. Select the appropriate storage device. Select Volume SYS Size and press Enter. Backspace over the current size. Type the new size and press Enter. Press F10 to save the settings and continue.

NOTE: If you plan to have additional volumes on the NetWare partition, remember to reduce the size of volume SYS so that the appropriate amount of disk space is available for other volumes.

## Edit Volume SYS Properties (If Required)

Although default settings work for most installations, you might need to modify volume properties such as block size, file compression, data migration, and suballocation.

The screenshot shows a terminal window titled "NetWare Installation". On the left is a vertical menu with options: "Create a Net", "Device", "NetWare", "Hot F", "Volume", and "Unpartitioned". The "Volume Information" window is open, displaying the following details:

Volume Name:	SYS
Volume Block Size:	32 KB Blocks
Status:	New, Not Mounted
File Compression:	On
Block Suballocation:	On
Data Migration:	Off

Below the table is an "Options" menu with two choices: "Continue" and "Modify". At the bottom of the screen, the following keyboard shortcuts are listed: Alt+F10=Exit, F10=Save, Esc=Cancel, F3=Volume Properties, and F1=Help.

HINT: To modify the properties of volume SYS, press F3.

- ◆ **Block size**—Block size is automatically optimized for your server, based on the size of the volume. Typically, a larger block size optimizes the volume for large files.
- ◆ **File compression**—By default, compression is automatically enabled. Enabling compression maximizes disk space but increases the file access time.

NOTE: Some backup programs cannot back up compressed files.

- ♦ **Data migration**—By default, data migration is automatically disabled. Data migration is used to identify inactive files and move them to near-line storage systems, such as optical disks.
- ♦ **Suballocation**—By default, suballocation is automatically enabled. Suballocation allows more efficient use of disk space with only a slight increase in access time. Suballocation allows blocks to contain data from more than one file.

## Summary

NetWare system files will now be copied to volume SYS.

NOTE: If you are installing from the network, you will be prompted to reconnect to the network. To continue the installation, enter the password for the user that originally logged in.

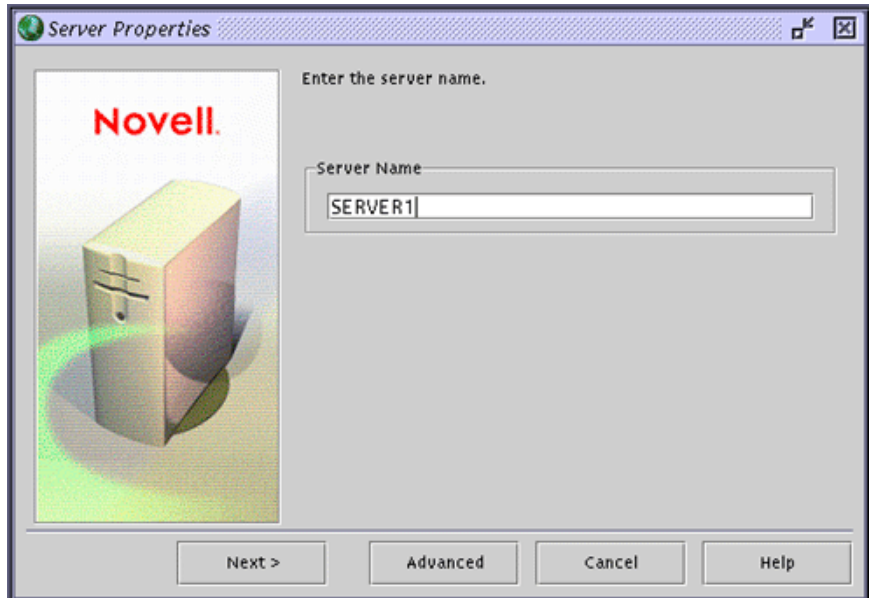
The NetWare 5.1 installation program will continue in graphical display mode.

## Name the Server

The NetWare 5.1 server name must be unique from all other servers on the NDS tree. The name can be between 2 and 47 alphanumeric characters and can contain underscores and dashes, but no spaces. The first character cannot be a period.

NOTE: The server name should be different from the name that you plan to use for the NDS tree.





Although a mouse is recommended, you can use the keyboard commands in [Table 2](#) to navigate through the installation program. Use the arrow keys on the numeric keypad for cursor movements.

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

**Table 2** Graphical Mode Keyboard Actions

Keystroke	Action
Tab	Move focus to next element
Shift+Tab	Move focus to previous element
Enter	Select
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 keypad	Accelerate cursor movement

Keystroke	Action
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 next window
Alt+F8	Move to previous window

## Install the NetWare Server File System

The server should now have a single NetWare partition and one volume named SYS. If you have space available for creating additional partitions and volumes, you can create them now.

NOTE: If you have allocated all available space to volume SYS, you will not be prompted for NetWare server file system information. You can skip to [“Install Networking Protocols” on page 39](#).

When installing the NetWare file system, you can

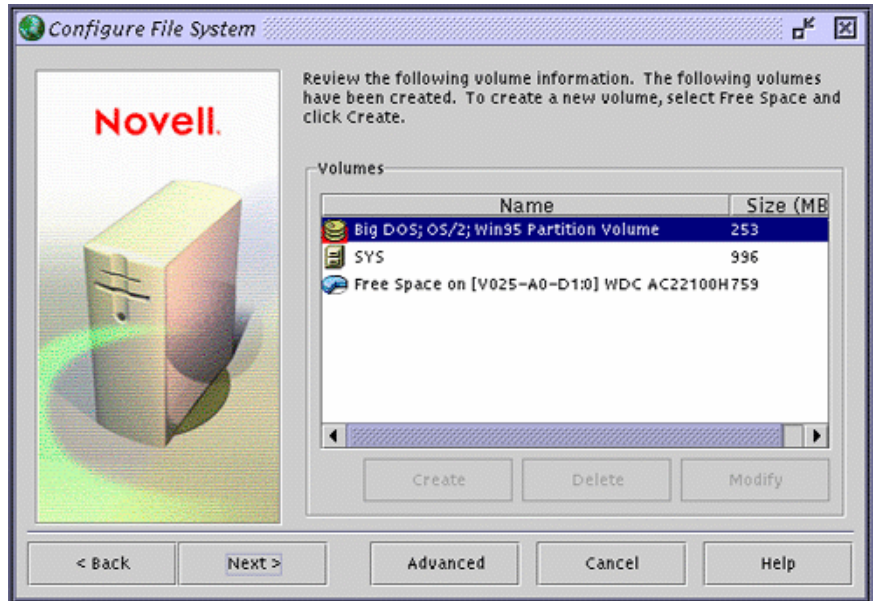
- ◆ Create additional volumes
- ◆ Modify volumes
- ◆ Delete volumes

## Understand Volumes

Volumes allow you to subdivide your partitions into more manageable sections. You can create two types of volumes—traditional volumes or Novell Storage Services (NSS) volumes.

- ◆ **Traditional NetWare volume**—Traditional NetWare volumes support all NetWare volume technologies including suballocation, compression, and Transaction Tracking System™ (TTS™).
- ◆ **NSS volume**—NSS is advanced file system technology that enhances the management of large files, large volumes, namespaces, and storage devices. The time required to mount large volumes is significantly reduced with NSS.

NOTE: NSS volumes in NetWare 5.1 do not support data migration, data duplexing, disk mirroring, disk striping, file compression, transaction tracking, File Transfer Protocol (FTP), VREPAIR, Network File System (NFS\*), or file name locks. If you require any of these technologies, use a traditional NetWare volume.



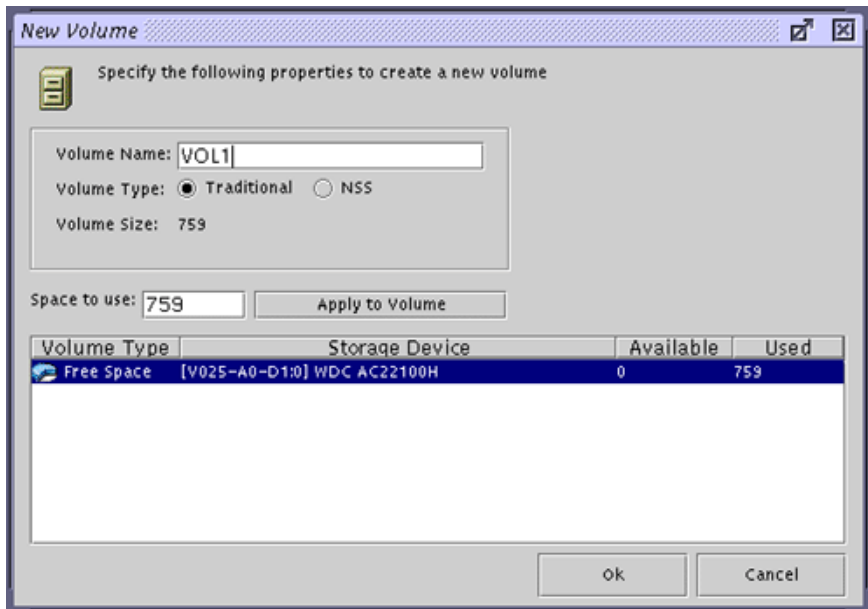
## Create Volumes

Additional volumes can be created from any available free space on a storage device. Volume names can be between 2 and 15 characters. Valid characters include A through Z, 0 through 9, and characters \_ ! - @ # \$ % & ( ). The volume name cannot begin with an underscore or have two or more consecutive underscores.

A large disk can be divided into several volumes during installation. Conversely, a volume can be distributed over multiple disks.

**WARNING:** Creating a volume that spans two or more storage devices is not recommended. If a volume spans disk devices and one of the devices fails, all data on the entire volume could be lost.

Traditional volumes can be created from either traditional or unpartitioned free space. Both types of free space appear the same on the NetWare File System screen.

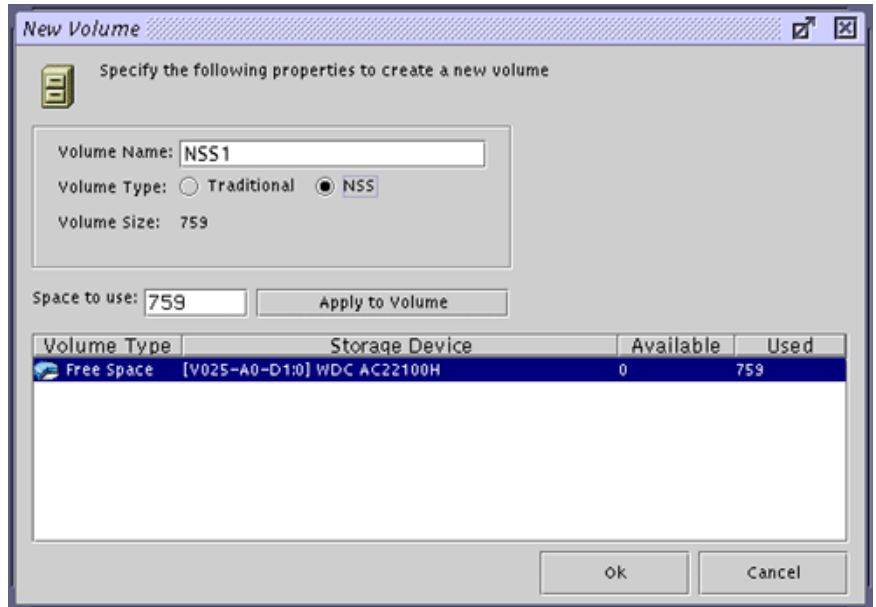


HINT: To create a traditional volume: Select free space and click Create. Type the name of the volume and click OK.

To allocate only a portion of the free space to the volume, type the amount of space to use, and click Apply to Volume.

To make the volume include additional free space, select an additional free space, type the amount of space to use, and click Apply to Volume.

NSS volumes can be created from unpartitioned free space.



HINT: To create an NSS volume: Select free space and click Create. (If the Volume Type option is not available, the selected free space is not available for NSS. Go back to the previous screen and select another free space.) Select Volume Type NSS. Type the name of the volume and click OK.

To allocate only a portion of the free space to the volume, type the amount of space to use, and click Apply to Volume.

To apply more free space to a volume, select an additional free space, type the amount of space to use, and click Apply to Volume.

## Modify Volumes

The size of any existing volume can be increased but not decreased. To decrease the size of an existing volume, the volume must be deleted and re-created.

HINT: To modify a volume: Select the volume to be modified. Click Modify.

## Delete Volumes

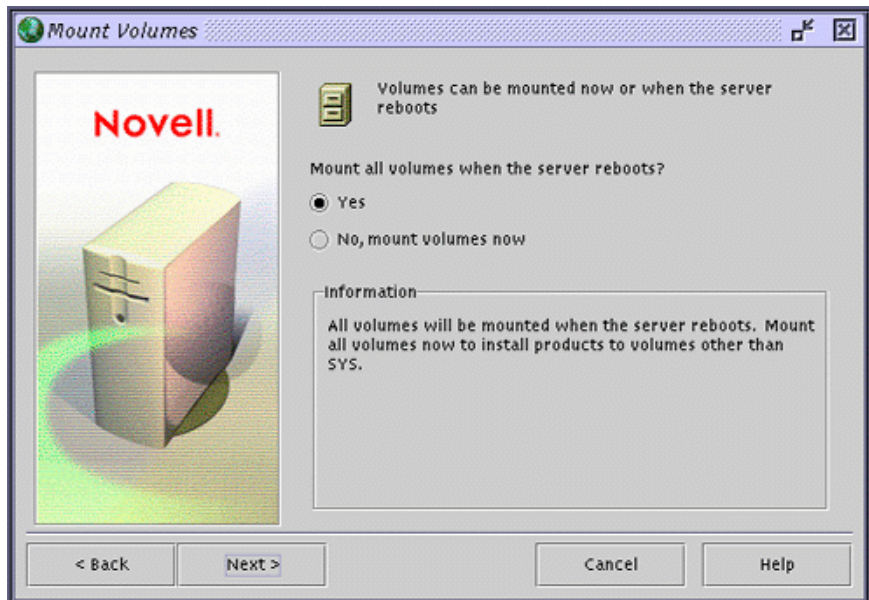
You can delete any volume you have created, except volume SYS. When a volume is deleted, all data on the volume is lost.

HINT: To delete a volume: Select the volume to be deleted. Click Delete.

## Mount Volumes

In order for volumes to be accessed by NetWare, they must be mounted. Volumes can be mounted immediately or at the end of installation.

NOTE: Depending on their size, volumes can take a considerable amount of time to mount.



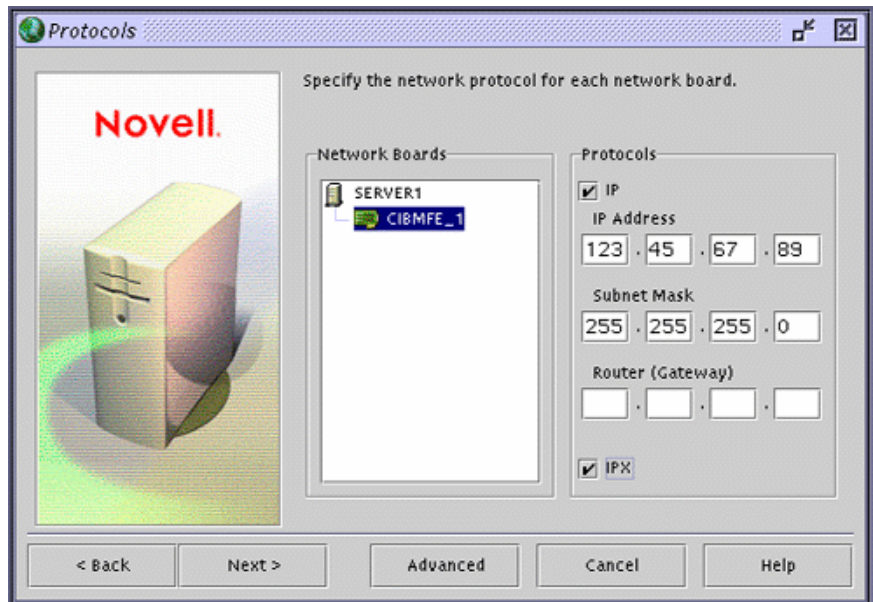
- ♦ **Mount Volumes Now**—You should mount volumes now if you plan to install additional products and services, such as documentation, on volumes *other* than volume SYS.
- ♦ **Mount Volumes after Installation Completes**—If you are installing products and services on volume SYS only, you can wait to mount volumes after the installation program completes.

# Install Networking Protocols

NetWare 5.1 can process IP (Internet Protocol) network packets and traditional IPX (Internetwork Packet Exchange™) packets. You can install networking protocols in the following ways:

- ◆ IP with IPX Compatibility Mode
- ◆ IP only
- ◆ IPX only
- ◆ IP and IPX

Protocols are assigned to network boards. Both protocols can be assigned to a single network board, which allows the server to communicate using IP and IPX.



HINT: To install IP with IPX Compatibility: Click a network board. Check the IP check box. Enter the required IP information.

To install IPX: Click a network board, then check the IPX check box.

## Install IP with IPX Compatibility Mode

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

When IP is selected, passive support for IPX is also provided. If an IPX request arrives at the server, NetWare 5.1 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.

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

If your server 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**—Subnet masks allow you to 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 router (gateway) is the address of the router that connects two different environments, such as a LAN and the Internet.

You can enter 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.



## Install IP Only

Internet Protocol (IP) can be installed without IPX Compatibility Mode enabled. When IPX Compatibility Mode is disabled, the server will process only IP packets. Applications that require IPX will not function properly.

NOTE: You can also disable Compatibility Mode by removing the **LOAD SCMD** command from the server's AUTOEXEC.NCF file.

## Install IPX

Novell's traditional protocol, Internetwork Packet Exchange (IPX), will allow you to continue using IPX-based applications. If only IPX 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.

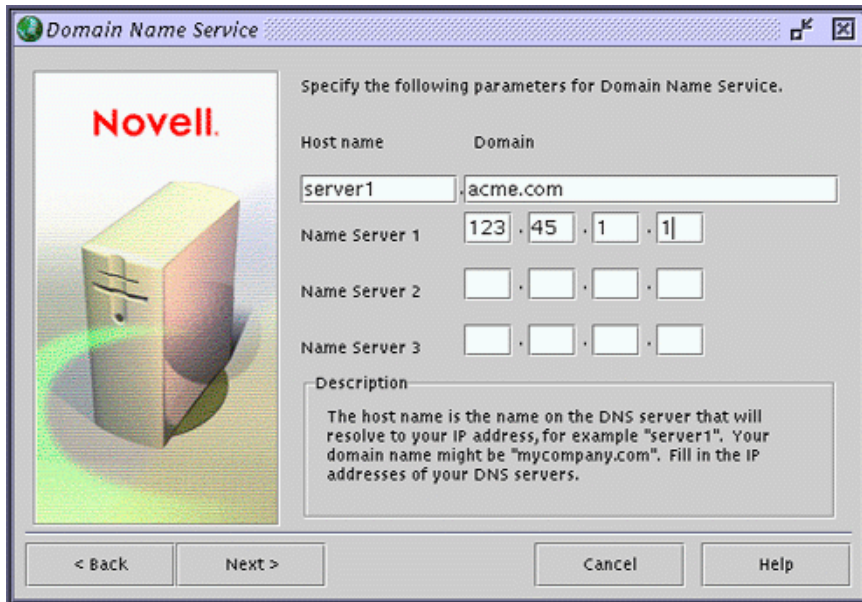
- ♦ **A single IPX frame type**—If a single frame type is detected, it will be installed.
- ♦ **Multiple IPX frame types**—If detected, you will be prompted to choose the frame types that you want to install.
- ♦ **No IPX frame types**—If no frame types are detected, Ethernet\_802.2 will be installed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

## Install 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. The server will broadcast and reply to IPX requests using IPX.

# Set 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.



NOTE: If this server will not be available to the Internet, you can skip this screen and ignore any associated error messages.

If you want this server to be available to the Internet, you must enter the following:

- ♦ **Host Computer**—The simple, readable name on the DNS server that matches this NetWare server's name (or the name that you have bound to the network board).

HINT: Set up the host computer name on the DNS server to use the NetWare server name.

- ♦ **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 NetWare server's simple, readable name and IP address. For more information, contact your system administrator or Internet service provider.

## **(Optional) Configure a NetWare Server as a DNS Server**

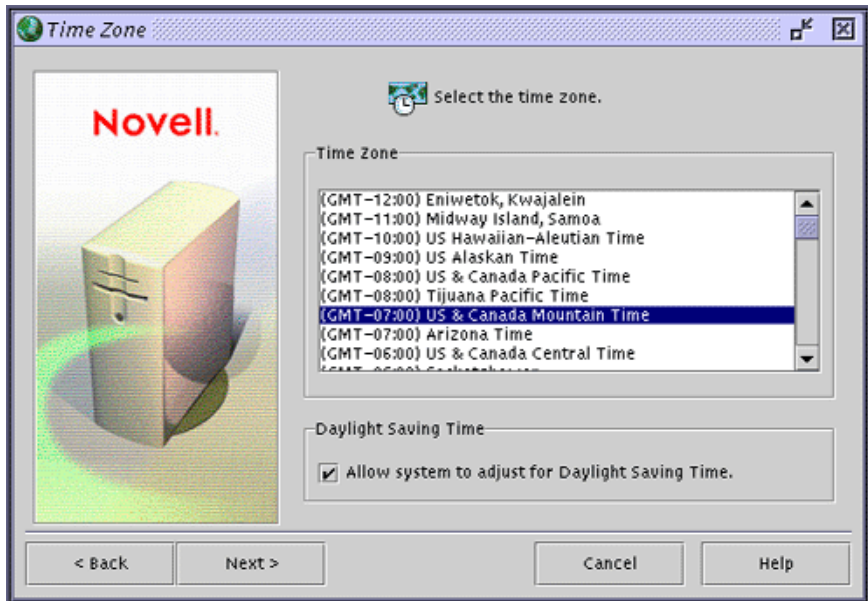
In addition to standard services, a NetWare server can be configured to provide DNS services.

To set up this NetWare server to provide DNS services:

- 1 Complete the NetWare server installation.
- 2 Log in to the NetWare server from a Windows workstation.
- 3 Run `SYS:PUBLIC\DNSDHCP\SETUP.EXE`.
- 4 Follow the on-screen instructions.

## **Set the Server Time Zone**

The server time and time zone are important in order to synchronize network events. Advanced time synchronization settings are available during the Customize section of the installation.



## Set Up NDS, the Novell Directory Technology

NDS, the Novell directory technology, provides global access to all networking resources. NDS 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 NDS tree. Users log in to the NDS tree with a single login name and password instead of logging in to specific servers.

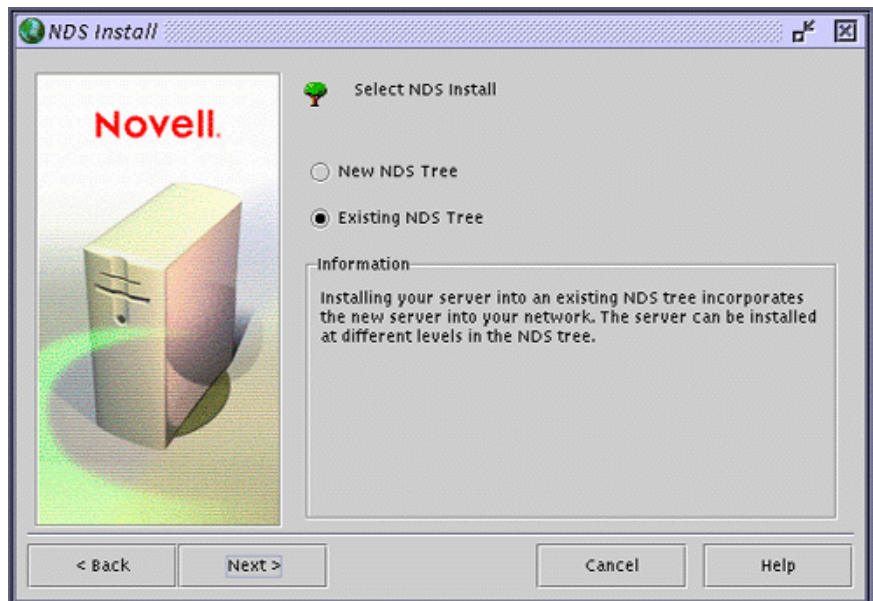
### Choose the Type of NDS Installation

To set up NDS, you must choose one of the following options:

- ◆ Install the server into an existing NDS tree
- ◆ Create a new NDS tree

Before completing this task, you should understand the concepts relating to NDS trees, containers, and context.

- ♦ **Tree**—The NDS tree name is the top level of the available network resources and must be unique from other NDS tree names on the network.
- ♦ **Containers**—Container objects, much like subdirectories, 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 NDS 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.



## Install the Server into an Existing NDS Tree

Installing your server into the existing NDS tree incorporates the server into your network.

Enter NDS information to create a new tree.

**NDS Information**

Tree Name: ACME\_INC

Context for Server Object: OU=SALES.O=ACME

**Administrator Information**

Admin Name: admin

Admin Context: OU=SALES.O=ACME

Password: \*\*\*\*\*

Retype Password: \*\*\*\*\*

< Back    Next >    Cancel    Help

The server can be installed in any Organization (O) or Organizational Unit (OU) container in the NDS tree where you have Supervisor rights. You can create containers during the installation program. You will be required to log in and provide the context, username, and password for the user with Supervisor rights to the container.

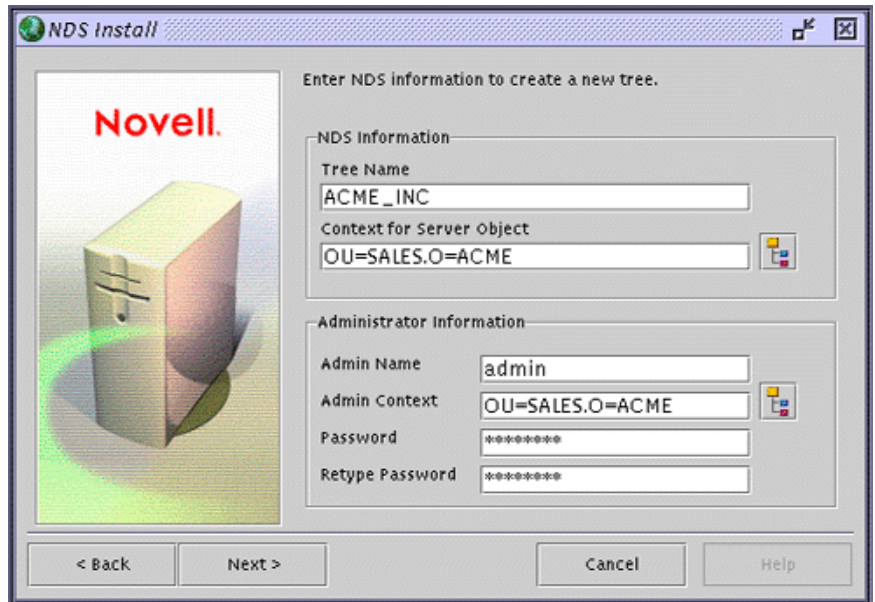
**NOTE:** If this is the first NetWare 5.1 server to be installed into an existing NDS tree, you should have already completed the Network Preparation section of the NetWare Deployment Manager utility.

NetWare Deployment Manager (NWDEPLOY.EXE) is located on the NetWare Operating System CD and is run from a Windows workstation.

If you have updated the NDS 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 NDS tree.

## Create a New NDS Tree

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



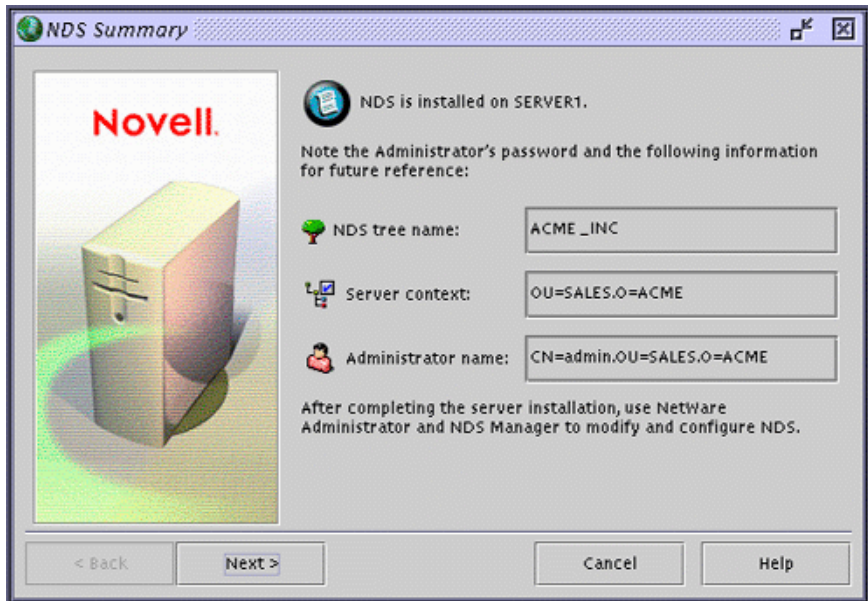
The screenshot shows the 'NDS Install' dialog box with the following fields and values:

Field	Value
Tree Name	ACME_INC
Context for Server Object	OU=SALES.O=ACME
Admin Name	admin
Admin Context	OU=SALES.O=ACME
Password	*****
Retype Password	*****

Each NDS tree must have a name unique from other NDS trees on the network. You will also be prompted to create a user (default name Admin) with Supervisor rights, identify an NDS context, and assign a password.

## Summary

Now that you have created a new NDS tree or installed the server into an existing NDS tree, the NetWare Server object and Volume objects will be installed in the container you specified.



If you have created a new NDS tree, a user (default name Admin) with Supervisor rights to the NDS tree will be created in the same NDS container as the NetWare Server object.

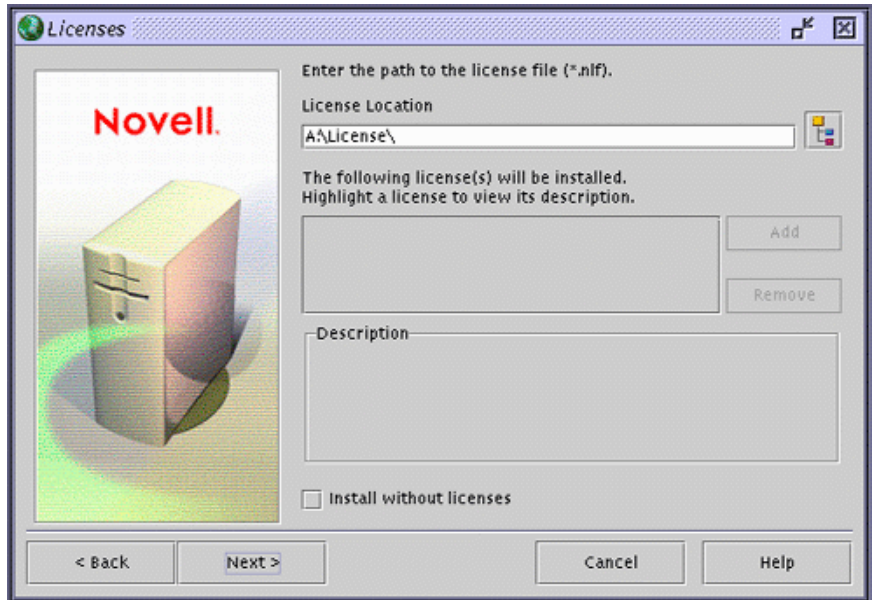
**IMPORTANT:** Record the administrator password and other relevant information before proceeding.

## License the NetWare Server

NetWare 5.1 must have a valid license in order to function as a server. You can install the license from the NetWare 5.1 License/Cryptography diskette or browse to a directory that contains NetWare 5.1 licenses.

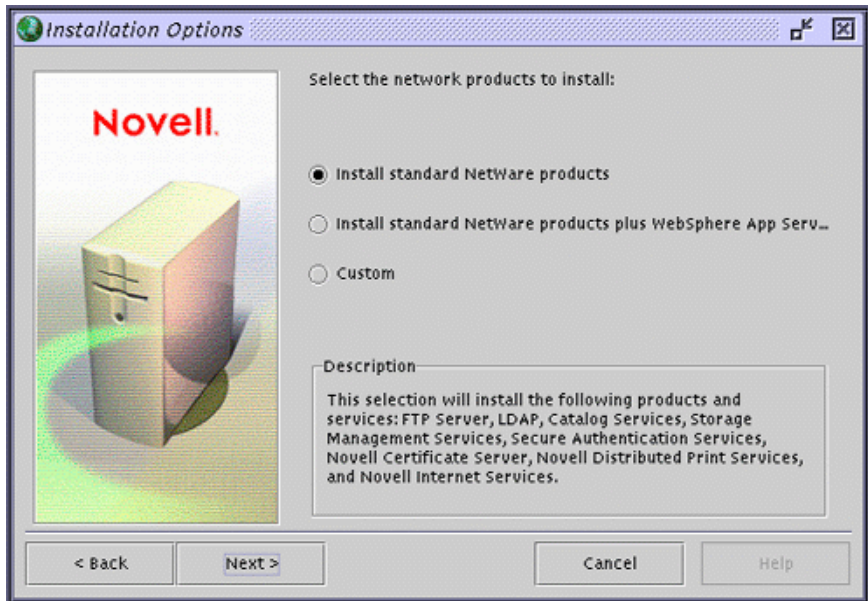
**Install without Licenses**—Although the server can be installed without a license, the unlicensed server will allow only two user connections. After installation, you can use the NetWare Administrator utility to install additional licenses.





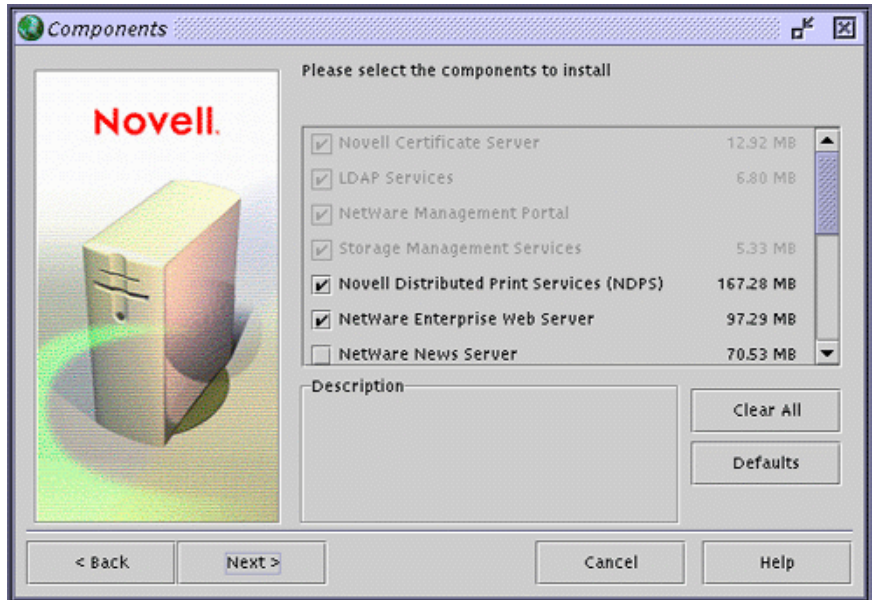
## Install Networking Products

After completing the NetWare server portion of the installation, you can select other networking products to install. Other networking products provide enhanced functionality, such as network management and Internet access, to NetWare 5.1.



- ◆ **Standard NetWare Products**—The standard network products for NetWare 5.1 will be installed.
- ◆ **Standard NetWare Products Plus Websphere Application Server for NetWare**—In addition to the standard network products included in NetWare 5.1, IBM Websphere Application Server for NetWare will be installed.
- ◆ **Custom**—You select which NetWare products to install.

HINT: To install a product, check the check box next to the product to be installed.



Although you can choose which products to install, installing the products that are already selected by default will ensure that you receive the features recommended for NetWare.

## Install Novell Certificate Server

Novell Certificate Server allows you to mint, issue, and manage digital certificates by creating a Security container object and an Organizational Certificate Authority (CA) object. The Organizational CA object enables secure data transmissions and is required for Web-related products such as NetWare Web Manager and NetWare Enterprise Web Server.

The *first* NetWare 5.1 server will automatically create and physically store the Security container object and Organizational CA object for the entire NDS tree. Both objects are created at, and must remain at the [Root] of, the NDS tree.

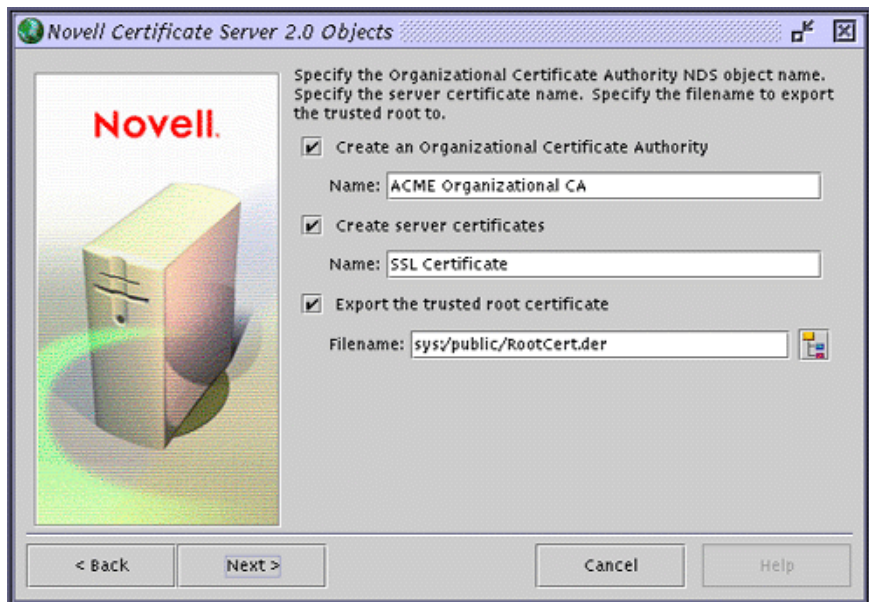
Only one Organizational CA object can exist in an NDS tree. Once the Organizational CA object is created on a server, it cannot be moved to another server. Deleting and re-creating an Organizational CA object will invalidate any certificates associated with the Organizational CA.

IMPORTANT: Make sure that the *first* NetWare 5.1 server is the server that you intend to permanently host the Organizational CA object and that the server will be a reliable, accessible, and continuing part of your network.

NOTE: To create the Security container object and the Organizational CA object, you must be logged in as a user with rights at [Root] of the NDS tree.

If this is *not* the first NetWare 5.1 server on the network, the installation program will find and reference the NetWare 5.1 server that holds the Organizational CA object. The installation program will access the Security container and create a Server Certificate object.

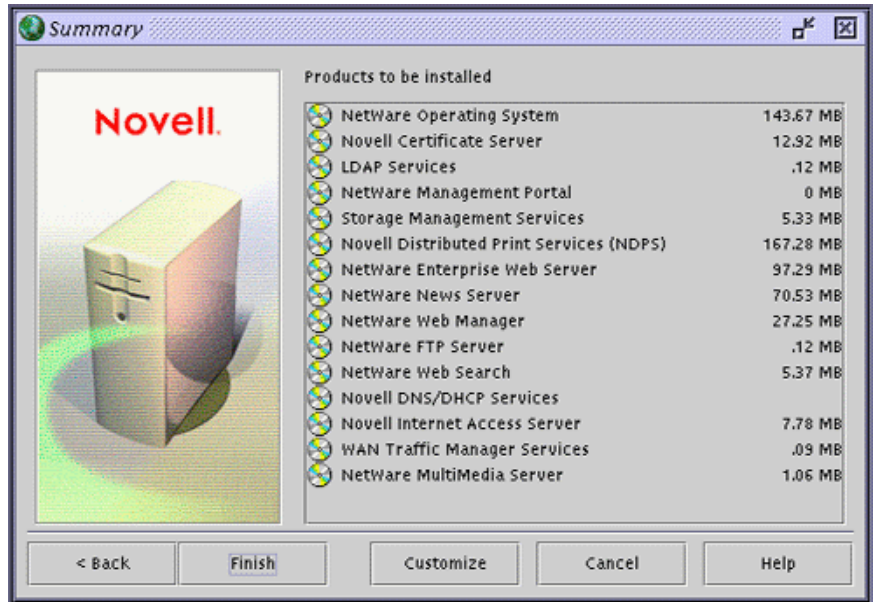
NOTE: To access the Security container and create a Server Certificate object, you must be logged in as a user with Read rights to the existing Security container object.



If an Organizational CA object is not available on the network, Web-related products such as NetWare Web Manager and NetWare Enterprise Web Server will not function.

# Customize the Installation

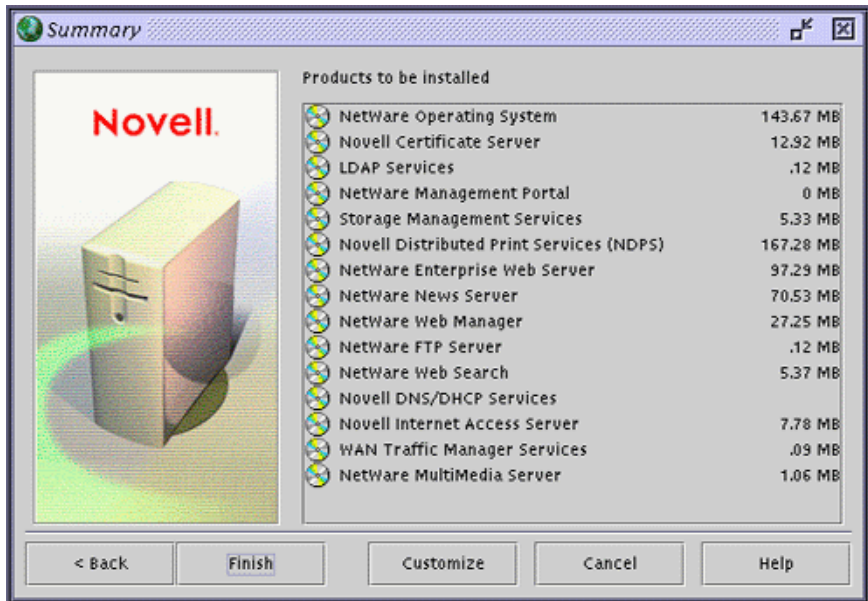
You can customize the installation of many products for your networking environment.



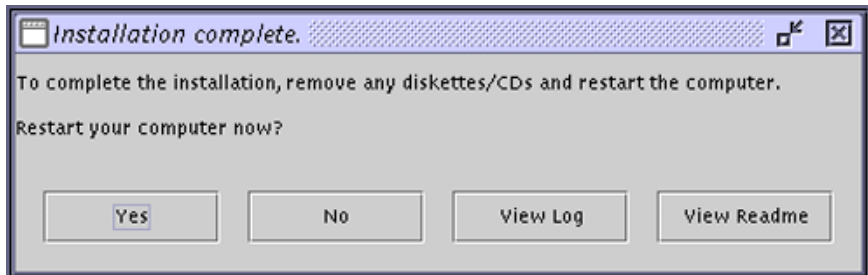
HINT: To customize products and components: From the Summary screen, click Customize. Select the product to customize. Click Properties. Modify the product as required. Click OK.

# Complete the Server Installation

The basic server installation is now complete. Depending on which additional products you are installing, you might be prompted to insert additional CDs.



HINT: From the Summary screen, click Finish to begin copying the files to the server. After all files are copied, the server must be rebooted in order for the settings to take effect.



HINT: After the files are copied, click Yes to reboot the server.

NetWare 5.1 is automatically loaded when the computer reboots, or you can load it manually.

HINT: To load the server manually: Reboot the server by clicking Yes. Change to the startup directory containing the NetWare server files (C:\NWSERVER). Enter **SERVER**.

You should now upgrade your existing workstations or install new workstations with the latest Novell Client software. For more information, see [Chapter 4, “Install Novell Clients,” on page 89](#).

You could also install and set up other networking products. For more information, see [Chapter 5, “Install Networking Products,” on page 105](#).





# 2

## Upgrade a NetWare Server to NetWare 5.1

The NetWare 5.1 installation program can be used to upgrade an existing NetWare<sup>®</sup> 3, NetWare 4, or NetWare 5 server to NetWare 5.1.

The upgrade process includes the following tasks:

- ♦ Meet system and software requirements
- ♦ Prepare the network and the computer
- ♦ Specify hardware and software settings
- ♦ Create additional volumes (if required)
- ♦ Select and install networking protocols
- ♦ Set up NDS<sup>®</sup>, the Novell<sup>®</sup> directory technology (if required)
- ♦ Install other networking products

During the upgrade program, the server is upgraded to NetWare 5.1 by automating the following tasks:

- ♦ Device drivers and LAN drivers for the NetWare 5.1 operating system are loaded. Outdated drivers are matched with and replaced by new drivers included with NetWare 5.1.
- ♦ NDS is installed or upgraded, depending on which NetWare version you are upgrading.
- ♦ NetWare 5.1 information is added to the AUTOEXEC.NCF and STARTUP.NCF files.
- ♦ The NetWare 5.1 files are copied to the server.
- ♦ Novell Distributed Print Services<sup>™</sup> (NDPS<sup>®</sup>) is installed.

# Meet System and Software Requirements

## System Requirements

To upgrade to NetWare 5.1, your system must meet the following minimum requirements:

NOTE: The system requirements listed below are minimum requirements. You can optimize the server performance by increasing the amount of server memory, disk space, and other components.

- A server-class PC with a Pentium\* II or higher processor.
- The server to be upgraded must be running NetWare 3.1x, NetWare 4.1x, or NetWare 5.0.
- A VGA or higher resolution display adapter (SVGA recommended).
- 35 MB of available disk space on the DOS partition.
- Minimum disk space requirement on volume SYS:
  - ◆ Standard NetWare products and WebSphere\* Application Server for NetWare—1.3 GB.
- Minimum memory requirements:
  - ◆ Standard NetWare products—128 MB.
  - ◆ NetWare products plus WebSphere Application Server for NetWare—256 MB (512 MB recommended).
  - ◆ All products including Oracle8—512 MB.
- One or more network boards.
- A CD drive. Bootable CD drives must support the El Torito specification.
- A PS/2\* or serial mouse is recommended, but not required.

NOTE: If your existing computer does not meet the minimum requirements, you may want to use Novell Upgrade Wizard to migrate files to another computer. See [Chapter 3, "Using Novell Upgrade Wizard," on page 63](#).

## Software and Other Requirements

Before installing, make sure that you have the following software and information:

- If this is the *first* NetWare 5.1 server on the network, you must:

- ◆ Make sure that this server will be a reliable, accessible, and continuing part of your network.

NOTE: The first NetWare 5.1 server will automatically create and physically store the Organizational Certificate Authority (CA) object for the entire NDS tree. The Organizational CA object enables secure data transmissions and is required for Web-related products such as NetWare Web Manager and NetWare Enterprise Web Server.

IMPORTANT: Once created, you should not delete or move the Organizational CA object.

- ◆ Have Supervisor rights at the [Root] of the NDS tree

- If this is *not* the first NetWare 5.1 server on the network, you must:

- ◆ Have Supervisor rights to the container where the server will be installed.
- ◆ Have Read rights to the Security container object for the NDS tree.

- NetWare 5.1 Operating System CD.

- NetWare 5.1 License/Cryptography diskette.

- DOS 3.3 or later installed on the bootable DOS partition.

NOTE: Do not use the version of DOS that ships with Windows\* 95, Windows 98, or Windows NT\* operating systems. DOS 7 is included on the NetWare 5.1 License diskette.

- DOS CD drivers.

- Client connection utilities (optional, for upgrading from a network):

- ◆ Novell Client™ for DOS and Windows 3.1x (optional, for upgrading from a NetWare server running IPX).
- ◆ IP Server Connection Utility (optional, for upgrading from a NetWare server running IP only). For instructions, see PRODUCTS\SERVERINST\IPCONN.TXT on the Novell Client CD.

- ❑ IP address and domain names (optional, for connecting to the Internet):
  - ◆ An IP address.
  - ◆ An IP address of a Domain Name Server.
  - ◆ The name of your domain.

NOTE: For IP addresses and domain names, contact your system administrator and Internet Service Provider (ISP).

- ❑ Network board and storage device properties, such as the interrupt and port address. For more information, contact your computer hardware manufacturer.

Next, you should prepare the network to receive a NetWare 5.1 server. If this server is the only server on the network, you can skip to [“Prepare the Server for the NetWare 5.1 Upgrade” on page 61.](#)

## Prepare the Network

Before you introduce a NetWare 5.1 server into an existing network that contains NetWare 4 servers, you must run NetWare Deployment Manager in order to update the network.

NOTE: A network consisting of only NetWare 3 servers does not need to be updated.

To update the network for NetWare 5.1, you must

- 1 Log in from a Windows 95/98 or Windows NT workstation to your existing network as a user with Supervisor rights.
- 2 Run NetWare Deployment Manager (NWDEPLOY.EXE), located on the NetWare 5.1 Operating System CD.
- 3 Complete the following tasks in the Network Preparation section:
  - 3a Back up NDS and server data.
  - 3b Update NDS.
  - 3c Prepare for NDS 8 (required if installing NetWare 5.1 with NDS 8).
  - 3d Install or update Novell Licensing Services.

After you have completed the Network Preparation section of NetWare Deployment Manager, you should now prepare the computer to be a NetWare server.

# Prepare the Server for the NetWare 5.1 Upgrade

To prepare your existing server for the NetWare 5.1 operating system:

- ◆ Back up the NetWare server files
- ◆ Verify a valid DOS partition
- ◆ Access the upgrade program

## 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.

## Verify a Valid DOS Partition

Your NetWare server uses a DOS partition to start the computer and load NetWare. Many of the existing NetWare startup files will be replaced with new NetWare 5.1 files. In addition, the DOS partition must have 35 MB of available space to accommodate new NetWare 5.1 files.

NOTE: If the DOS partition does not have 35 MB of available space, you cannot upgrade the server. You must create a new DOS partition and install a new server. See [Chapter 1, "Install a NetWare 5.1 Server," on page 13](#).

## Access the Installation Files

Your NetWare server can be upgraded from the server's local CD drive or from installation files located on the network. Before you can access the NetWare 5.1 installation program, you must complete the following steps.

- 1 Install the DOS CD driver for your CD drive onto the DOS partition. DOS CD drivers are provided by the CD drive manufacturer.

NOTE: Make sure that the logical filename of your CD drive (specified in the CONFIG.SYS and AUTOEXEC.BAT files) is *not* CDROM or CDINST.

- 2 Install Novell Client™ software (conditional, if upgrading using installation files located on a network).
- 3 Make sure that the CONFIG.SYS file contains the following commands:  
**FILES=40** and **BUFFERS=30**.

- 4 (Conditional) If you are installing from files located on a network, install the Novell Client for DOS and Windows 3.1x or IP Server Connection Utility software located on the Novell Client CD.

After installing and accessing the CD, you can begin the upgrade by inserting the NetWare 5.1 CD or by accessing the installation program on the network drive.

## What's Next

After accessing the NetWare 5.1 installation program, follow the instructions for installing a server beginning with **“Begin the Installation” on page 19.**

HINT: Don't forget to select Upgrade as the type of installation.

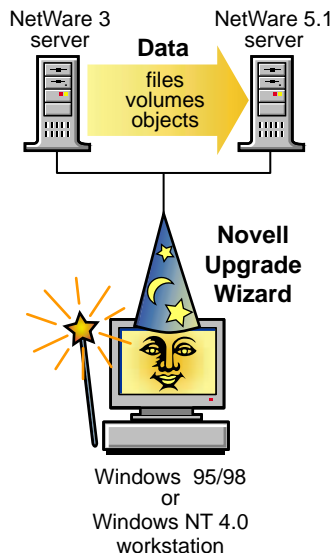
# 3

## Using Novell Upgrade Wizard

Novell® Upgrade Wizard helps you copy the files and objects from an existing server running NetWare® to another server running a later version of NetWare.

NOTE: These instructions describe how to migrate data from a NetWare 3 or NetWare 4 server to a NetWare 5.1 server; however limited instructions are also provided on how to migrate NetWare 3 or NetWare 4 data to a NetWare 5.0 server.

The following figure shows Novell Upgrade Wizard managing the migration of data from a NetWare 3 server to a NetWare 5.1 server.



**Migrating NetWare 3 data to NetWare 5.1.** Novell Upgrade Wizard copies the NetWare 3 file system and bindery objects to another server running NetWare 5.1. When the bindery objects are copied to the NetWare 5.1 destination server, they are placed in the NDS<sup>®</sup> tree and automatically converted to NDS objects. Novell Upgrade Wizard will *not* migrate data from a NetWare 3.x source server to a NetWare 4.10 destination server. Valid destination servers are NetWare 4.11, 4.2, 5.0 and 5.1.

If you are migrating data from NetWare 3, go to [“Migrate Data from NetWare 3 to NetWare 5.1” on page 64.](#)

**Migrating data from NetWare 4 to NetWare 5.1.** Novell Upgrade Wizard migrates files and NDS information from a NetWare 4 server to a faster, more reliable computer running NetWare 5.1. After NDS is migrated, the NetWare 5.1 destination server replaces and assumes the identity of the NetWare 4 source server on the network.

If you are migrating data from NetWare 4, go to [“Migrate Data from NetWare 4 to NetWare 5.1” on page 70.](#)

## Migrate Data from NetWare 3 to NetWare 5.1

To copy the data from an existing NetWare 3.x server to NetWare 5.1, you must:

- ◆ Meet system and software requirements
- ◆ Prepare the NetWare 3 source server
- ◆ Prepare the NetWare 5.1 destination server
- ◆ Run Novell Upgrade Wizard
- ◆ Select files and objects to migrate to the destination server
- ◆ Migrate the objects to the destination server
- ◆ Perform post-migration procedures

Continue with [“Meet System and Software Requirements” on page 65.](#)



# Meet System and Software Requirements

## Workstation Requirements

Novell Upgrade Wizard requires the following workstation configuration:

- A Windows\* 95/98 or Windows NT\* (4.0 or later) workstation with 50 MB of available disk space.
  - ◆ The Windows 95/98 workstation must be running Novell Client for Windows 95/98 version 3.3 or later.
  - ◆ The Windows NT workstation must be running Novell Client for Windows NT version 4.8 or later.

To check your current Novell Client version, right-click the red Novell N and select Novell Client Properties. Click the Client tab to view your current client version.

- Make sure that your Novell Client workstation is running IPX.

To check your Novell Client protocol, right-click NetWork Neighborhood, then select Properties > Bindings.

## Source and Destination Server Requirements

Novell Upgrade Wizard requires the following source and destination server configurations:

- A source server running NetWare 3.11, 3.12, or 3.2.
- A destination server running NetWare 5.1.
- Make sure that the source server, destination server, and client workstation are running on a common LAN segment (IPX external network number) or that SAP filtering is disabled on the destination server.

NOTE: To disable SAP filtering, enter **LOAD INETCFG** at the server console of the NetWare 5.1 server and select Protocols > IPX. Next, change the state of Filtering Support from enabled to disabled.

- Supervisor or supervisor-equivalent rights, including Console Operator rights, to the containers where both the source and destination servers reside.
- The IPX protocol bound and running on the NetWare 5.1 destination server.

Continue with [“Prepare the NetWare 3 Source Server”](#) on page 66.

## Prepare the NetWare 3 Source Server

The source server is the computer that contains the data—such as files, volumes, and bindery objects—that will be copied and migrated to the destination server. Valid NetWare 3 source servers can be running NetWare 3.11, 3.12, or 3.2.

To prepare a NetWare 3 source server:

- 1 Back up all data.
- 2 Verify that you have Supervisor rights to the container where the source server resides.

Continue with [“Prepare the NetWare 5.1 Destination Server”](#) on page 66.

## Prepare the NetWare 5.1 Destination Server

The destination server is the server that receives the data migrated from the source server. After data is copied from a NetWare 3 server, it appears in the destination server’s NDS tree. Valid destination servers can be running NetWare 4.11, 4.2, 5.0, or 5.1.

To prepare a destination server to receive data from a NetWare 3 source server:

- 1 Identify an existing destination server, or install a new destination server by following the NetWare 5.1 installation instructions.

**WARNING:** If you are installing a NetWare 5.1 server, make sure that you check the box for IPX from the protocol screen.

If you are migrating to an existing NetWare 5.1 server, make sure that IPX is bound to the network board on the NetWare 5.1 server. If IPX is not bound and running on the NetWare 5.1 destination server, the migration will fail. To check whether IPX is bound, enter `CONFIG` at the NetWare 5.1 server console.

2 If you are migrating data to a version of NetWare other than NetWare 5.1, update the destination server with the latest software from the [Novell Support Connection Web site \(http://www.support.novell.com\)](http://www.support.novell.com). Search for the following updates by entering the name of the NetWare Support Pack into the Quick Search field:

- ◆ NetWare 5.0 requires NetWare 5 Support Pack 3 (NW5SP3a.EXE) or later.
- ◆ NetWare 4.11 and 4.2 require NetWare 4 Support Pack 6a (IW4SP6A.EXE) or later.

IMPORTANT: Novell Upgrade Wizard does *not* migrate data from NetWare 3.x to NetWare 4.10.

3 Verify that the destination server has enough disk space to accommodate the files and directories moving from the source server.

4 Verify that your source server, destination server, and client workstation are running on a common LAN segment or that SAP filtering is disabled on the destination server.

NOTE: Refer to [“Source and Destination Server Requirements” on page 65](#) for instructions on disabling SAP filtering.

5 Back up NDS and all data.

6 Continue with [“Run Novell Upgrade Wizard” on page 67](#).

## Run Novell Upgrade Wizard

To run Novell Upgrade Wizard:

- 1 Insert the NetWare 5.1 Operating System CD into the CD drive of your Windows 95/98 or Windows NT workstation.
- 2 Run Novell Upgrade Wizard (Products\upgrdwr\UPGRDWRD.EXE), located on the NetWare 5.1 Operating System CD.

NOTE: If this is the first time that you have run Novell Upgrade Wizard, when you click the Novell Upgrade Wizard executable, it will launch an installation program before you can actually run the application. The installation program, by default, installs Novell Upgrade Wizard at this location: Start menu > Programs > Novell > Novell Upgrade Wizard > Novell Upgrade Wizard.

3 Create a new project. This requires naming and saving the project and logging in to the source and destination trees.

4 Continue with [“Select Files and Objects to Migrate to the Destination Server” on page 68](#).

## Select Files and Objects to Migrate to the Destination Server

The designated source server's bindery objects and volume data and the destination server's NDS tree are displayed in the Project Window.

To begin the migration process, first determine which NetWare 3 bindery objects and volume data will be copied to which containers on the destination server's NDS tree, then complete the following steps:

- 1 Drag the bindery and volume objects from the source server and drop the bindery into containers and the volumes into folders on the destination NDS tree.

To create a new NDS Organizational Unit (also called a container), right-click on the parent of the Organizational Unit.

To create a new folder, right-click on an existing folder.

- 2 Verify that the data can be copied.

To verify, click Project > Verify Project.

**IMPORTANT:** If you are notified during the verification that certain NLM files are outdated on the source server, you must update those NLM files on your NetWare 3.x source server. To update the NLM files, you must copy them from the Products/NM3X directory. It is important that you copy *only* the NLM files that Novell Upgrade Wizard prompts you to. After copying all NLM files that you were prompted to, reboot the NetWare 3.x source server and launch Novell Upgrade Wizard again.

The Products/NM3X directory is located in the same directory where Novell Upgrade Wizard was installed. By default, the Products/NM3X directory is installed in this path: C:\Program Files > Novell > Novell Upgrade Wizard > Products > NW3X.

- 3 Review the verification results page and resolve *all* critical errors.

Warning errors can be fixed after the migration.

- 4 Continue with **“Migrate the Objects and Volumes to the Destination Server's NDS Tree”** on page 69.

## Migrate the Objects and Volumes to the Destination Server's NDS Tree

Although you have selected the containers where the NetWare 3 data will be copied, no data has yet been migrated. When migrated, the bindery data is converted to NDS objects and placed in the NDS tree on the destination server.

To migrate the objects and volumes to the destination server:

- 1 Click Project > Migrate.
- 2 Continue with [“Perform Post-Migration Tasks” on page 69](#).

### Perform Post-Migration Tasks

After migrating the files and objects to the destination server, you should:

- ◆ Modify the print configuration.

For more information, see the [Novell Distributed Print Services Administration Guide](#).

- ◆ Make sure that applications have migrated correctly.

After migration, if you want to install additional network products and services, go to the NetWare Deployment Manager utility (NWDEPLOY.EXE) located at the root of the NetWare 5.1 Operating System CD, and select Post-Installation Tasks > Install NetWare 5.1 Products.

You can also install additional network products from the server console by clicking the red Novell button on the servertop.

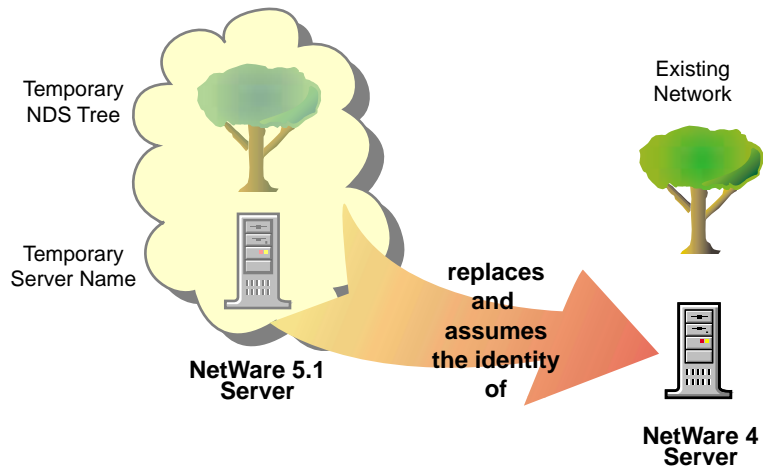
- ◆ Make sure that user information has migrated correctly.
- ◆ Modify the container and user login scripts to accommodate the new NDS tree that has been introduced into the network.

For more information, see [Setting Up Login Scripts](#) in [Novell Client for Windows](#).

# Migrate Data from NetWare 4 to NetWare 5.1

When you migrate data from NetWare 4 to NetWare 5.1, you must first install a new NetWare 5.1 server in a temporary NDS tree. Once this is done, Novell Upgrade Wizard copies the files and data from the NetWare 4 server to the newly installed NetWare 5.1 server and migrates the NetWare 4 NDS information to the NetWare 5.1 server.

After the NetWare 4 NDS data is migrated to the new NetWare 5.1 server, the NetWare 4 source server will automatically be brought down and the NetWare 5.1 server will reboot. The NetWare 5.1 server will appear in the same NDS container with the same name as the NetWare 4 source server.



To upgrade from NetWare 4 to NetWare 5.1, you must:

- ◆ Plan your migration process
- ◆ Meet system and software requirements
- ◆ Prepare the network
- ◆ Prepare the NetWare 4 source server
- ◆ Prepare the NetWare 5.1 destination server
- ◆ Run Novell Upgrade Wizard
- ◆ Perform post-migration tasks

## Plan Your Migration Process

You should start by migrating one replica ring at a time.

- 1 First, migrate the server that contains the Master replica of [Root].
- 2 Next, migrate all Read/Write replicas within that same replica ring.
- 3 Then, migrate all Read-Only replicas within that same replica ring.
- 4 Migrate all servers without replicas last.
- 5 After you have migrated the replica ring that contained the Master replica of [Root], migrate each replica ring in this order: Master replicas, Read/Write replicas, Read-Only replicas, and servers without replicas.

Continue with **“Meet System and Software Requirements”** on page 71.

## Meet System and Software Requirements

Novell Upgrade Wizard requires the following system and software configuration.

- A Windows 95/98 or Windows NT (4.0 or later) workstation with 50 MB of available disk space.
  - ◆ The Windows 95/98 workstation must be running Novell Client for Windows 95/98 version 3.1 or later with Support Pack 1 or later or ZENworks 2.0.
  - ◆ The Windows NT workstation must be running Novell Client for Windows NT version 4.6 or later with Support Pack 1 or later.
- A NetWare 4 source server running the NetWare 4.10, 4.11, or 4.2 operating system, and the latest updates. Updates are available at the [Novell Support Connection Web site \(http://www.support.novell.com\)](http://www.support.novell.com). Search for the support pack by entering the name into the Quick Search field.
  - ◆ NetWare 4.10 requires 410PT8B.EXE, DS410P.EXE, LIBUPI.EXE, STRTL7.EXE, and SMSUP6.EXE or later. Copy these files to the SYS:SYSTEM directory.
  - ◆ NetWare 4.11 and 4.2 require NetWare 4 Support Pack 6a (IW4SP6A.EXE) or later.

- ❑ Verify that the NetWare 4 source server is running long namespace support for Windows 95/98 and Windows NT on all volumes to be copied.

To add long namespace support to a NetWare 4.11 or NetWare 4.2 server, at the server console, enter **LOAD LONG**, then enter **ADD NAME SPACE LONG TO *volumename***. To add long namespace support to a NetWare 4.10 server, at the server console, enter **LOAD OS2**, then enter **ADD NAME SPACE OS2 TO *volumename***.

- ❑ A destination server running the NetWare 5.1 operating system (NetWare 5.1 requires 128 MB of RAM).
- ❑ If the destination server will be the first NetWare 5.1 server in the NDS partition, the NetWare 4 source server must have a Read/Write or Master NDS replica prior to migrating.
- ❑ A client connection to the source and destination servers using the IPX protocol.
- ❑ Make sure that the source server, destination server, and client workstation are running on a common LAN segment (IPX external network number).

If it is impossible for the destination server and source server to be on a common LAN segment, disable SAP filtering between the source and destination servers.

- ❑ Source and destination servers running the IPX protocol.
- ❑ Make sure no other network products besides Storage Management Services™ (SMS™), LDAP, Novell Certificate Server, and NetWare Management Portal™ are installed on the NetWare 5.1 destination server.
- ❑ Supervisor or supervisor-equivalent rights, including Console Operator rights, to the container where the source and destination servers reside.

Continue with **“Prepare the Network”** on page 73.



## Prepare the Network

Before introducing a NetWare 5.1 server into an existing network containing NetWare 3 or NetWare 4 servers, you must run NetWare Deployment Manager in order to update the network.

To update the network for NetWare 5.1:

- 1 Log in from a Windows 95/98 or Windows NT workstation to your existing network as a user with Supervisor rights to the container where the source and destination servers reside.
- 2 Run NetWare Deployment Manager utility (NWDEPLOY.EXE), located at the root of the NetWare 5.1 Operating System CD.
- 3 Complete the following tasks in the Network Preparation section:
  - 3a Back up NDS<sup>®</sup> and server data.
  - 3b Update NDS.
  - 3c Prepare for NDS 8 (required only if installing NetWare 5.1 with NDS 8).
  - 3d Install or update Novell Licensing Services.

Continue with [“Prepare the NetWare 4 Source Server” on page 73](#).

## Prepare the NetWare 4 Source Server

The source server is the NetWare 4 server that contains the files, volumes, and NDS objects that will be copied to the NetWare 5.1 destination server. Valid NetWare 4 source servers can be running NetWare 4.10, 4.11, or 4.2.

To prepare a NetWare 4 source server:

- 1 Verify that you have supervisor rights to the container where the source server resides.

To verify supervisor rights, use NetWare Administrator.
- 2 If the destination server will be the first NetWare 5.1 server in the NDS partition, make sure that the NetWare 4 source server has a Read/Write or Master NDS replica.

To verify replica status, use NDS Manager (NDSMGR16.EXE).

- 3 Update the source server with the latest software.
  - ◆ NetWare 4.10 requires 410PT8B.EXE, DS410P.EXE, LIBUPLI.EXE, STRTL7.EXE, and SMSUPG.EXE or later. Copy these files to the SYS:SYSTEM directory.
  - ◆ NetWare 4.11 and 4.2 require NetWare 4 Support Pack 6a (IW4SP6A.EXE) or later.
- 4 Make sure that long namespace support is running on all volumes to be copied.

To add long namespace support to a NetWare 4.11 or NetWare 4.2 server, at the server console, enter **LOAD LONG**, then enter **ADD NAME SPACE LONG TO volumename**. To add long namespace support to a NetWare 4.10 server, at the server console, enter **LOAD OS2**, then enter **ADD NAME SPACE OS2 TO volumename**.
- 5 Load DSREPAIR and run Unattended Full Repair.

Make sure that Unattended Repair, Time Synchronization, and Report Synchronization Status finish with no errors.
- 6 Back up NDS and all data.
- 7 If the source and destination servers are not running on a common LAN segment, disable SAP filtering between the source and destination servers.

To disable SAP filtering, load INETCFG at the server console and go to Protocols > IPX > Filtering Support. If SAP filtering cannot be disabled, you should ensure that the default server (preferred server) for the workstation is on the same LAN segment as the destination and source server.
- 8 Continue with **“Prepare the NetWare 5.1 Destination Server”** on page 75.

## Prepare the NetWare 5.1 Destination Server

The destination server is the new computer that will receive the data from the source server. After data is migrated from a NetWare 4 source server to a NetWare 5.1 destination server, the destination server will reboot and assume the name and identity of the NetWare 4 source server on the network.

To prepare a NetWare 5.1 destination server to receive data from a NetWare 4 source server:

- 1 Install a new server with the NetWare 5.1 operating system by following the NetWare 5.1 installation instructions. (See [Chapter 1, “Install a NetWare 5.1 Server,”](#) on page 13.)

Select the Custom option and make sure that no other network products besides Storage Management Services (SMS), LDAP, Novell Certificate Server, and NetWare Management Portal™ are selected.

**IMPORTANT:** When you install NetWare 5.1, four network products—SMS, LDAP, Novell Certificate Server, and NetWare Management Portal—are automatically installed. During migration, the NDS objects for SMS, LDAP, and Novell Certificate Server, as well as any applications that have files or NLM programs located in the SYS:SYSTEM directories, are removed from the NDS tree.

Although the NDS objects are removed, the NLM programs for these products still exist. Because you cannot manage applications without their corresponding NDS objects, you must reinstall the applications to restore their NDS objects to the NDS tree.

Reinstall these applications after NDS has been migrated. See [“Perform Post-Migration Tasks”](#) on page 78.

- 2 Enter a temporary name for the NetWare 5.1 server.

**IMPORTANT:** The temporary name and temporary NDS tree name must not be the same as the source server’s name or NDS tree name; otherwise, the destination server, after migration, will not assume the name of the source server.

- 3 Create a temporary NDS tree with a temporary NDS tree name.

- 4 Create a volume SYS on the destination server that is the same size, or larger than, volume SYS on the source server.

Volume names and sizes on the destination server must be the same as the volume names and sizes on the source server.

- 5 Install and configure the IPX protocol.

The IPX protocol must be installed on the destination server for the migration. You can remove IPX after completing the migration.

**IMPORTANT:** Do not run compatibility mode on the NetWare 5.1 destination server. Compatibility mode prevents the IPX protocol from binding to the network board.

Also, IP addresses from the source server will not be migrated. If you want to use the source server's IP address on the destination server, in the Edit Configuration Files window of Novell Upgrade Wizard, copy the source server's address and paste it into the destination server's AUTOEXEC.NCF file.

To simply modify the IP Address, use INETCFG.NLM on the destination server.

- 6 Continue with **“Run Novell Upgrade Wizard”** on page 76.

## Run Novell Upgrade Wizard

To run Novell Upgrade Wizard:

- 1 Insert the NetWare 5.1 Operating System CD into the CD drive of your Windows 95/98 or Windows NT workstation.
- 2 Run Novell Upgrade Wizard (Products\upgrdwr\UPGRDWRD.EXE), located on the NetWare 5.1 Operating System CD.

**NOTE:** If this is the first time you have run Novell Upgrade Wizard, when you click the Novell Upgrade Wizard executable, it will launch an installation program before you can actually run the application. The installation program, by default, installs Novell Upgrade Wizard at this location: Start menu > Programs > Novell > Novell Upgrade Wizard > Novell Upgrade Wizard.

- 3 Create a new project. This requires naming and saving the project, and logging in to the source and destination trees.
- 4 Click Copy Volumes.

You do not need to copy all volumes at once. You can select volumes to copy now and copy other volumes later by reopening the project file.

**IMPORTANT:** If you choose not to migrate a volume, once NDS is migrated from the NetWare 4 source server to the NetWare 5.1 destination server, you will lose the trustee assignments for the volume that you chose not to migrate.

If you have big volumes, slow LAN connections, source and destination servers on different LAN segments, or if you want to reconfigure your data by putting existing directories into different folders on the destination server, you may consider using a backup tape to copy your volumes. To use a tape backup:

- ◆ Deselect all volumes on the Volumes to Copy screen in Novell Upgrade Wizard.
- ◆ Use your backup software to back up your volumes to a backup tape and continue the Novell Upgrade Wizard procedures of editing the configuration files and migrating the NDS.

NOTE: If you use a tape backup to copy your volumes, restore the volume data *after* NDS is migrated to the NetWare 5.1 destination server. Once the volume data is restored, complete the post-migration tasks.

IMPORTANT: When you installed NetWare 5.1 on the destination server, the SYS:SYSTEM and SYS:PUBLIC directories were created for you. Do *not* restore the source server's SYS:SYSTEM and SYS:PUBLIC directories to the NetWare 5.1 destination server.

## 5 (Optional) Click Edit Configuration Files.

Novell Upgrade Wizard allows you to modify any NCF files on the NetWare 5.1 destination server. These files contain default LOAD statements and parameters.

If the source server was running an NLM program or application that you want to run on the destination server, copy and paste the commands from the configuration file on the source server to the corresponding configuration file on the destination server. Make sure that the application is compatible with NetWare 5.1.

## 6 Click NDS Migration > Migrate NDS.

After you click Migrate NDS, Novell Upgrade Wizard will instruct you to run DSREPAIR, copy the NDS configuration files (if coming from a BorderManager™ 4.x server), select a licensing option, confirm passwords, and resolve all critical errors. Warning errors can be resolved after the NDS migration.

At the end of this step, the NetWare 4 server will be brought down and the NetWare 5.1 server will reboot and assume the name and identity of the NetWare 4 server.

## 7 Click Continue NDS Migration.

**IMPORTANT:** When the NetWare 5.1 server reboots, you may see warnings on the server console of the destination server regarding the four default network products—SMS, LDAP, Novell Certificate Server, and NetWare Management Portal™—that were installed with the NetWare 5.1 operating system. Ignore the warnings and reinstall the products after the NDS has been migrated.

- 7a** Make sure that the NetWare 5.1 destination server has restarted and taken over the identity and name of the NetWare 4 source server.
- 7b** Wait approximately 30 minutes for the NDS tree to synchronize.
- 7c** Make sure that time synchronization on the NetWare 5.1 server matches time synchronization on all other servers in the NDS tree.

To check NDS synchronization status, enter **DSREPAIR** at the server console and select Report Synchronization Status. If the NetWare 5.1 destination server does not contain a Read/Write or Master replica, you must check NDS synchronization by running **DSREPAIR** on another server in the NDS tree that has a Read/Write or Master replica.

If NDS is not synchronized, enter the following commands at the NetWare 5.1 server console:

```
SET DSTRACE=ON
SET DSTRACE=*U
SET DSTRACE=*H
SET DSTRACE=+SYNC
```

- 7d** Resolve any Novell Licensing Services errors recorded in the NUW.ERR error log file.

To view the error log file, enter **EDIT SYS:SYSTEM/NUW30/NUW.ERR** at the server console.

- 7e** After meeting the conditions listed above, click Migrate.

Continue with [“Perform Post-Migration Tasks” on page 78](#).

## Perform Post-Migration Tasks

After upgrading the server, you should:

- ♦ Run **DSREPAIR** on the NetWare 5.1 server and select Unattended Full Repair.
- ♦ Make sure that user information migrated successfully.

- ◆ Make sure that products and applications migrated successfully.
  - ◆ Reinstall SMS, LDAP, and Novell Certificate Server.
 

Go to the server console and click the red Novell button on the server top.
  - ◆ Reinstall any applications that have files or NLM programs associated with the following volume SYS directories: SYSTEM, PUBLIC, MAIL, ETC, and NETBASIC.
 

To reinstall these network products and services, go to the NetWare Deployment Manager utility (NWDEPLOY.EXE), located on the NetWare 5.1 Operating System CD, and select Post-Installation Tasks > Install NetWare 5.1 Products.

If your NetWare 4.x source server was a BorderManager server, complete the following:

- 1 Disconnect the NetWare 4 source server from the network.
- 2 Restart the server by entering **RESTART** at the DOS prompt.
- 3 Load the NUWNICIO.NLM program at the server console.
- 4 Follow the on-screen instructions.

## Troubleshooting

If you are unable to reconnect to the NetWare 5.1 destination server after it reboots, see [“Unable to Reconnect to the Destination Server After It Has Rebooted” on page 80](#).

In some cases, migration of data to the destination server may fail. If this occurs, you will need to restore the NetWare 4 server and the destination server to their original configuration before you try again to migrate data to the destination server.

- ◆ If the migration failed and your server was in an NDS tree with multiple servers, go to [“Restore the NetWare 4 Server to Its Original Configuration—Multiserver Tree” on page 81](#).
- ◆ If the migration failed and your server was the *only* server in an NDS tree, go to [“Restore the NetWare 4 Server to Its Original Configuration—Single-Server Tree” on page 87](#).

## Unable to Reconnect to the Destination Server After It Has Rebooted

NOTE: If the NetWare 4 server and the NetWare 5 server are on different LAN segments, you may not be able to reconnect until the router table updates itself. The router table update may take several minutes. Try logging in again after the NetWare 5.1 server restarts.

During the Migrate NDS portion of a NetWare 4 to NetWare 5.1 upgrade, if you fail to reconnect after the destination server reboots:

- 1 Locate a server containing an NDS partition of the destination server.
- 2 At the console of that server, enter **LOAD DSREPAIR**.
- 3 Make sure that the Time Synchronization and Report Synchronization Status programs report that the server is synchronized.

If the time synchronization has errors, there may be communication problems between the source and destination servers. To check your server-to-server communication, go to the server console of the source server and run IPX PING (IP PING if you have a NetWare 5.0 server with IP); follow the on-screen prompts.

For more information on server-to-server communication, go to the [Novell Support Connection Web site \(http://www.support.novell.com\)](http://www.support.novell.com), and enter “625 errors” into the Quick Search field. Look for the Troubleshooting 625 Error Summary document.

- 4 From the Windows 95/98 or Windows NT client, right-click the red Novell N and select NetWare Connections.

IMPORTANT: Novell Upgrade Wizard only supports the IPX protocol.

- 5 Select the NDS tree that contains the destination server that you tried to migrate.
- 6 Click Detach.
- 7 Log in again to the NDS tree and the destination server that you are trying to upgrade.
- 8 If you still have problems connecting to the target server, reboot the client workstation and then log in to the target server again.



## Restore the NetWare 4 Server to Its Original Configuration— Multiserver Tree

The instructions for restoring the NetWare 4 server to its original configuration are different depending on when the migration of data failed.

If the migration failed *before* the NetWare 5.1 destination server could take over the name and identity of the NetWare 4 server, complete the steps in the following sections:

- 1 “Remove NDS from the NetWare 4 Source Server—Multiserver Tree” on page 84.
- 2 “Restore the NetWare 4 Source Server—Multiserver Tree” on page 85.

If the migration failed *after* the NetWare 5.1 destination server had taken on the name and identity of the NetWare 4 server, and the NetWare 4 server that you were migrating data from did *not* have a Master replica, complete the steps in the following sections:

- 1 “Remove NDS from the NetWare 5.1 Destination Server—Multiserver Tree” on page 82.
- 2 “Remove NDS from the NetWare 4 Source Server—Multiserver Tree” on page 84.
- 3 “Restore the NetWare 4 Source Server—Multiserver Tree” on page 85.
- 4 “Reinstall NetWare 5.1—Multiserver Tree” on page 86.

If the migration failed *after* the NetWare 5.1 destination server had taken on the name and identity of the NetWare 4 server, and the NetWare 4 server you were migrating data from *did* have a Master replica:

- 1 Bring down the NetWare 5.1 destination server.
- 2 Complete the steps in the following sections:
  - 2a “Designate Another Server as the New Master Replica” on page 87.
  - 2b “Remove NDS from the NetWare 4 Source Server—Multiserver Tree” on page 84.
  - 2c “Restore the NetWare 4 Source Server—Multiserver Tree” on page 85.
  - 2d “Prepare the NetWare 5.1 Destination Server” on page 75.

## Remove NDS from the NetWare 5.1 Destination Server—Multiserver Tree

To remove NDS from the NetWare 5.1 destination server:

- 1 At the NetWare 5.1 server console, enter **LOAD NWCONFIG**.
- 2 Select Directory Options > Remove Directory Services from This Server.  
Ignore errors and confirm deletion of NDS (Directory Services).
- 3 Select Yes to Remove Directory Services.
- 4 Enter the Admin username and password.
- 5 Press Enter to reference a different object.  
WARNING: Do not press Esc.  
If you do press Esc, the references you entered will not be saved to the server.
- 6 (Conditional) If prompted, enter the Admin username as the placeholder object distinguished name, then enter [Root] as the distinguished name to change from.
- 7 If the information about single reference time source appears, review the information and press Enter.

To verify that NDS was removed:

- 1 At the NetWare 5.1 server console, enter **LOAD NWCONFIG**.
- 2 Select Directory Options > Remove Directory Services from This Server.

If a message indicates that Directory Services is already removed, continue with **“Remove NDS from the NetWare 4 Source Server—Multiserver Tree”** on page 84.

If NDS was *not* successfully removed, complete the following instructions to force NDS off the NetWare 5.1 server:

- 1 At the NetWare 5.1 server console, enter **LOAD NWCONFIG -DSREMOVE**.
- 2 Select Directory Options > Select Remove Directory Services from This Server.

The DSREMOVE option tells NWCONFIG to ignore all warning and error messages and remove Novell Directory Services<sup>®</sup>. The error and warning messages will still appear and may prompt for the Admin account and password. Just ignore or work through them. For example, if prompted for the Admin account and password, simply press Esc.

NWCONFIG will still try to perform such steps as backing up trustee assignments, deleting server volume objects, clearing incoming connections, and changing necessary replica types, etc. But, if a step fails, NWCONFIG will probably report that the operation failed even though it has removed Directory Services.

Once NDS has been removed, you must manually remove the NetWare 5.1 server from any replica rings that it was previously contained in and then delete the server and volume objects from the NDS tree.

To remove the server from the replica ring and the server and volume objects from the NDS tree:

- 1 Bring down the server and turn it off.
- 2 Use NDS Manager to delete the server object.
- 3 Use NetWare Administrator to delete the volume objects.
- 4 Once the server and volume objects have been deleted, go to the server console of the server containing the master replica of the replica ring and enter **LOAD DSREPAIR -A**.
- 5 Select Advanced Options > Replica and Partition Operations.
- 6 Select the replica ring where the downed NetWare 5.1 server was originally located.
- 7 Select View the Replica Ring, then select the downed NetWare 5.1 server.
- 8 Select Remove This Server from the Replica Ring.
- 9 Enter your Admin distinguished name and password.
- 10 To confirm that you want to remove the server from the replica ring, enter "I agree" when prompted.

IMPORTANT: Make sure that you follow this procedure for each partition that the downed server held.

Continue with ["Remove NDS from the NetWare 4 Source Server—Multiserver Tree"](#) on page 84.

## Remove NDS from the NetWare 4 Source Server—Multiserver Tree

To remove NDS from the NetWare 4 source server:

- 1 At the NetWare 4 source server console, enter **LOAD INSTALL**.
- 2 Select Directory Options > Remove Directory Services from This Server.  
Ignore errors and confirm deletion of NDS (Directory Services).
- 3 Select Yes to remove NDS (Directory Services).

If a message indicates that Directory Services is already removed, continue with [“Restore the NetWare 4 Source Server—Multiserver Tree” on page 85](#).

If NDS was *not* properly removed, complete the following instructions to force NDS off the NetWare 4 server:

- 1 At the NetWare 4 server console, enter **LOAD INSTALL -DSREMOVE**.
- 2 Select Directory Options > Remove Directory Services from This Server.

The DSREMOVE option tells INSTALL to ignore all warning and error messages and remove Novell Directory Services. The error and warning messages will still appear and may prompt for the Admin account and password. Just ignore or work through them. For example, if prompted for the Admin account and password, simply press Esc.

INSTALL will still try to perform such steps as backing up trustee assignments, deleting server volume objects, clearing incoming connections, and changing necessary replica type, etc. But, if a step fails, INSTALL will probably report that the operation failed even though it has removed Directory Services.

Once NDS has been removed, you must manually remove the NetWare 5.1 server from any replica rings that it was previously contained in and then delete the server and volume objects from the NDS tree.

To remove the server from the replica ring and the server and volume objects from the NDS tree:

- 1 Bring down the server and turn it off.
- 2 Use the NDS Manager™ utility to delete the Server object.
- 3 Use NetWare Administrator to delete the Volume objects.

- 4 Once the server and volume objects have been deleted, go to the server console of the server containing the master replica of the replica ring and enter **LOAD DSREPAIR -A**.
- 5 Select Advanced options menu > Replica and Partition Operations.
- 6 Select the replica ring where the downed NetWare 4 server was originally located.
- 7 Select View the replica ring, then select the downed NetWare 4 server.
- 8 Select Remove This Server from the Replica Ring.
- 9 Enter your Admin distinguished name and password.
- 10 To confirm that you want to remove the server from the replica ring, enter “I agree” when prompted.

IMPORTANT: Make sure that you follow this procedure for each partition that the downed server held.

Continue with [“Restore the NetWare 4 Source Server—Multiserver Tree” on page 85](#).

## Restore the NetWare 4 Source Server—Multiserver Tree

Once NDS was removed, you removed the server from any replica rings that held a partition of the NetWare 4 source server. You then removed the NetWare 4 source server’s corresponding server objects and volumes from the NDS tree. Next, complete the following steps to restore the NetWare 4 source server.

- 1 Reboot the NetWare 4 source server.
- 2 At the NetWare 4 source server console, enter **LOAD INSTALL**.
- 3 Select Directory Services > Install Directory Services onto This Server.
- 4 Select the NDS tree where the NetWare 4 source server existed prior to migration.
- 5 Select a time zone and time configuration parameters.
- 6 Enter the Admin name and password.
- 7 Enter the context where the NetWare 4 source server existed prior to migration.
- 8 Save the NDS (Directory) information and continue.
- 9 Wait while the server synchronizes with the NDS tree.

- 10 Select Restore Trustees from the Novell Upgrade Wizard Tools menu to restore the trustee assignments.
- 11 Use NDS Manager to check whether the NDS replicas that previously existed on the NetWare 4 source server still exist. If the NDS replicas do not exist, use NDS Manager to create them.

The NetWare 4 server is now restored to its original configuration.

Although you have restored the NetWare 4 server to its original configuration, you may need to complete more tasks depending on when the migration of data to the NetWare 5.1 destination server failed.

- ◆ If the migration failed *before* the NetWare 5.1 destination server took over the name and identity of the NetWare 4 server, you are ready to start the migration once again. Begin with [Step 4 on page 76](#).
- ◆ If the migration failed *after* the NetWare 5.1 destination server had taken on the name and identity of the NetWare 4 source server and the NetWare 4 server did *not* have a master replica, continue with [“Reinstall NetWare 5.1—Multiserver Tree” on page 86](#).
- ◆ If the migration failed *after* the NetWare 5.1 destination server had taken over the name and identity of the NetWare 4 server and the NetWare 4 source server *did* have a master replica, continue with [“Prepare the NetWare 5.1 Destination Server” on page 75](#).

## Reinstall NetWare 5.1—Multiserver Tree

To perform the upgrade again, you must reinstall NetWare 5.1.

To reinstall NetWare 5.1:

- 1 Bring down the NetWare 5.1 destination server.
- 2 Do a new installation of NetWare 5.1 by following the on-screen instructions.

After following the screen instructions, you can try the migration process again. Begin with [Step 4 on page 76](#).

## Designate Another Server as the New Master Replica

If the server you tried to migrate held the Master replica, you will need to designate another server to be the Master replica before you can restore the NetWare 4 source server and NetWare 5.1 server to their original configurations.

- 1 Locate another server in the replica ring.
- 2 At the designated server console, enter **LOAD DSREPAIR**.
- 3 Select Advanced Options > Replica and Partition Operations.
- 4 Select the replica ring that the downed NetWare 5.1 server was located in.
- 5 Select Designate This Server as the New Master Replica.

Continue with “[Remove NDS from the NetWare 4 Source Server—Multiserver Tree](#)” on page 84.

## Restore the NetWare 4 Server to Its Original Configuration—Single-Server Tree

To restore the NetWare 4 source server, you must:

- ◆ Complete the steps in “[Restore the NetWare 4 Source Server—Single-Server Tree](#)” on page 87.
- ◆ Complete the steps in “[Reinstall NetWare 5.1—Single-Server Tree](#)” on page 88.

For instructions on multiserver trees, see “[Restore the NetWare 4 Server to Its Original Configuration—Multiserver Tree](#)” on page 81.

## Restore the NetWare 4 Source Server—Single-Server Tree

To restore the NetWare 4 source server to its original configuration:

- 1 Enter **RESTART SERVER** at the NetWare 4 server console.
- 2 After the server restarts, enter **LOAD DSMMAINT** at the NetWare 4 server console.
- 3 Select Restore NDS Following Hardware Upgrade.
- 4 Press Enter to rename the NDS file and select Yes to confirm the chosen name.

NDS should now be successfully restored to the server.

- 5 Select Restore Trustees from the Novell Upgrade Wizard Tools menu to restore trustee assignments.
- 6 Restart the server.

The NetWare 4 source server is now returned to its original configuration.

### **Reinstall NetWare 5.1—Single-Server Tree**

To perform the upgrade again, you must reinstall NetWare 5.1.

To reinstall NetWare 5.1:

- 1 Bring down the NetWare 5.1 destination server.
- 2 Do a new installation of NetWare 5.1 by following the on-screen instructions.

After following the screen instructions, you can try the migration process again. Begin with [Step 4 on page 76](#).



# 4

## Install Novell Clients

This section explains how to install Novell® Client™ for Windows\* NT/2000 and Novell Client for Windows 95/98 software, either from CD on one workstation or across the network. It describes how to do the following:

- ◆ “Preparing to Install the Client Software” on page 90
- ◆ “Installing Clients from CD-ROM” on page 94
- ◆ “Installing Clients from the Network” on page 96
- ◆ “Upgrading a Client Workstation to Windows 2000” on page 103

# Preparing to Install the Client Software

Before installing the client software, make sure the server and workstations have sufficient resources and the required software. The hardware and software setup for the server and client workstations require you to complete the following tasks:

- ◆ Check server protocols and requirements
- ◆ Locate the latest Novell Client software
- ◆ Check for a valid network connection
- ◆ Check client workstation requirements

## Checking Server Protocols and Requirements

You must prepare your servers to work with the Novell Client software. You must know what protocols you use on the server and make sure that the servers are configured to support long filenames. NetWare® 5 automatically supports long filenames and does not need to have the name space added to it. However, you must add long filename support to NetWare 3.x and NetWare 4.x servers.

You can install Novell Client with one of the following protocol options:

- ◆ IP Only (NetWare 5)

Installs the IP protocol stack, which allows the client to run in IP-only networks; the workstation cannot communicate with IPX™ servers.

- ◆ IP with IPX Compatibility Mode (NetWare 5)

Installs IP and includes Compatibility mode, which allows IPX applications to run in IP-only networks by converting IPX packets into IP packets. IPX Compatibility mode allows the client to communicate with services in IPX-only networks if the Migration Agent is installed on any NetWare 5 servers. IPX Compatibility mode requires Service Location Protocol (SLP) on the server.

**WARNING:** Workstations using IPX Compatibility Mode cannot have an IPX internal network number configured. If you have configured an IPX internal network number on your workstation and you are planning to install the Novell IP Client with IPX Compatibility Mode, then remove the IPX internal network number before installing the client.

- ◆ IP and IPX (default for new installations)

Allows the client to run in both IP and IPX networks. The workstation uses the same protocol as the server it is communicating with.

- ◆ IPX Only

Allows the client to run in IPX-only networks. This option does not install IP.

NOTE: If you are upgrading Novell Client software and you are keeping the same protocol option, you do not need to select a protocol option. The previous protocol configuration remains unchanged unless you choose a different protocol.

NOTE: Novell recommends the Typical Installation option for most customers installing Novell Client. If you are installing Novell Client and you choose Custom Installation, note that the Novell IP Gateway is not compatible with NetWare IP or CMD (IPX Compatibility Mode Driver).

## Adding Long Name Space

Make sure that long filename support is installed on NetWare 3.x or NetWare 4.x servers. NetWare 5 servers automatically support long filenames.

IMPORTANT: Each name space added to a volume requires additional server memory. If you add name space support to a volume on a server without sufficient memory, that volume cannot be mounted. Once a name space is added to a volume, the name space can be removed from the volume only by deleting the volume and re-creating it, or by using VREPAIR.

- 1 Load the long name space.

At the server console prompt, enter

```
LOAD LONG.NAM
```

NOTE: On versions of NetWare prior to NetWare 4.11, use the OS/2\* name space, OS2.NAM. For NetWare 3.11 servers, use OS2OPNFX.NML for long filenames. This NLM™ is a part of 311PTD.EXE and is available on the Novell Web site.

- 2 Add the long name space.

At the server console prompt, enter

```
ADD NAME SPACE LONG TO VOLUME volume_name
```

## Locating the Latest Client Software

Novell Client software is shipped on CD and is also available from the Novell Web site. You should install the latest client version. If you purchased a Novell product, you can use the Novell Client included with that product.

- 1 Create an installation directory.
- 2 At [www.novell.com/download](http://www.novell.com/download), click the client software that you want to download.
- 3 Follow the download instructions provided with the files on the Web site.

## Preparing Client Workstations

### Checking Client Workstation Requirements

Client workstations must meet certain requirements before you install or upgrade Novell Client software:

#### Workstation Hardware and Software

Platform	Hardware	Software
Windows 95/98	<ul style="list-style-type: none"><li>◆ 486 processor or better</li><li>◆ Minimum 28 MB free disk space</li><li>◆ Minimum 16 MB RAM</li></ul>	<ul style="list-style-type: none"><li>◆ Windows 95/98 (Windows 95 must be version A or later or you must use Service Pack 1 from Microsoft.*)</li><li>◆ Windows 95 or Windows 98 CD or the Windows .CAB files</li></ul>

Platform	Hardware	Software
Windows NT/2000	<ul style="list-style-type: none"> <li>◆ Minimum hardware requirements of Windows NT* 4.0</li> <li>◆ Minimum hardware requirements of Windows 2000</li> <li>◆ Minimum 24 MB RAM</li> </ul>	<ul style="list-style-type: none"> <li>◆ Windows NT 4.0 or Windows 2000 (Windows NT must have Service Pack 3 or later.)</li> </ul>

### The Network Board

Novell Client supports NDIS\* drivers. For information about installing the network board, refer to the manufacturer's instructions.

**IMPORTANT:** By default, ODI™ drivers are not installed. If you are upgrading an older version of the client and you have ODI drivers currently installed, these drivers are still supported. If you are installing for the first time, NDIS drivers will be installed. If you do not already have the necessary NDIS driver, you might need to obtain it from the operating system CD or from the network board manufacturer.

**NOTE:** Remote Management in the full version of ZENworks for Desktops depends on Workstation Manager. If you plan to use Remote Management, make sure that Workstation Manager is installed on all workstations that will be managed remotely. Remote Management is not compatible with IP Gateway.

## Incompatibilities

### Windows 95/98

The following network components are not compatible with Novell Client for Windows 95/98:

- ◆ Microsoft Client for NetWare networks
- ◆ Microsoft file and printer sharing for NetWare networks
- ◆ Microsoft Service for NDS® software
- ◆ Novell NetWare workstation shell 3.x (NETX)
- ◆ Novell NetWare workstation shell 4.0 and later (VLM™) clients
- ◆ Novell IPX ODI protocol 16-bit module for the NETX and VLM clients

If any of these network components are installed, the client installation program detects the conflict and removes the conflicting network components.

### **Windows NT/2000**

For up-to-date information about software incompatibilities, see the Novell Client for Windows NT/2000 readme file, WINNT.TXT.

## **Additional Information**

[“Installing Clients from CD-ROM” on page 94](#)

[“Installing Clients from the Network” on page 96](#)

## **Installing Clients from CD-ROM**

If you plan to install Novell Client software on a small number of workstations, or if the workstations are not yet connected to a network, install from the Novell Client CD.

NOTE: If installing or upgrading Novell Client software on several workstations on the network, consider using the network installation explained in [“Installing Clients from the Network” on page 96](#).

You can install the Novell Client using the Application Launcher component of ZENworks™. Application Launcher lets you distribute applications such as the client software to workstations and manage those applications as objects in the NDS tree. For more information, see the ZENworks documentation.

The Novell Client Setup utility installs Novell Client software on workstations running Windows. This utility lets you select the client that you want to install from a list of available clients. Administrative options are also available.

To install from a local CD drive:

- 1 Insert the Novell Client CD.

If the Novell Client Setup utility does not automatically launch, run WINSETUP.EXE from the root of the CD.

- 2 Click a language.
- 3 Click a platform.

- 4 Click the software to install.

This starts the installation utility for that software.

- 5 Follow the on-screen instructions.

Once Novell Client is installed, check your network protocol configuration. See [“Configuring Network Protocols” on page 95](#).

## Configuring Network Protocols

After you install Novell Client, make sure that it is configured correctly for your network.

**WARNING:** Before you configure network protocols, make sure you have the correct information and any addresses needed. If you configure protocols incorrectly, the workstation will not be able to connect to the network, or it may conflict with other workstations using the same address.

- 1 Right-click Network Neighborhood, then select the protocol that you want to configure and click Properties.
- 2 Configure the protocol options in each tab, then click OK.

For example, if your network uses DHCP to assign IP addresses automatically, click the IP Address tab, then click Obtain IP Address Dynamically. Or, if you must use a static IP address, click Specify an Address and enter a valid IP address.

**HINT:** Click the question mark in the upper-right corner, then click on any field for more information.

- 3 Click OK to make the changes.

**NOTE:** You might be prompted to supply the Windows operating system CD. If you do not have access to the correct files, you may not be able to create a network connection.

You should now set the Novell Client properties for the workstation. See [Setting Client Properties](#).

# Installing Clients from the Network

You can install Novell Client software on multiple workstations from the network by copying files to the server and modifying the login script. This installation is sometimes referred to as an Automatic Client Upgrade (ACU).

You can install and upgrade the client software on all platforms when users log in. The process involves six tasks:

- ◆ Create a folder on the server.
- ◆ Copy Novell Client files and other required files to this folder. Workstations can then read the files during login.
- ◆ Grant rights to the new folder.
- ◆ Modify the ACU configuration file.
- ◆ (Optional) Create or update the platform-specific configuration files.
- ◆ Create or modify the login script. (A sample login script is included.)

When the login script runs, ACU.EXE determines if the client needs to be upgraded. This initial check saves network bandwidth during login since the setup utility is only run if the client needs to be updated.

## Create a Folder

- 1 Log in to a server as Admin or as a user with Admin equivalence.

Make sure that you have rights to copy files to a network folder that all users can access, as well as rights to modify login scripts.

- 2 Create a folder in SYS:PUBLIC.

For example,

`SYS:\PUBLIC\CLIENT`



## Copy Files

- 1 From the PRODUCTS directory on the Novell Client CD, copy the WINNT or WIN95 directories to the new folder.

If you are installing only one platform, you need to copy only the platform directory (WINNT or WIN95) for the platform you will install.

If you are installing the client in only one language or if your network does not have enough space to accommodate multiple language directories, you can delete the language directories that you do not need from the NLS directory under each client directory. To ensure that you have all necessary files, copy the entire client directory and then delete only the extra language directories.

- 2 (Conditional) If you are installing Novell Client for Windows 95/98, copy the Windows 95 and/or Windows 98 .CAB files to the WIN95 directory.

The files are on the Microsoft Windows 95 or Windows 98 CD (and Upgrade CD) in the respective WIN95 or WIN98 folder.

## Grant Rights

- 1 Create a Group object in the NDS tree.
- 2 Place into that group users whose workstations need to be installed or upgraded.
- 3 Make sure that the group has Read and File Scan rights to the folder that you created.

NOTE: If you created a folder in SYS:PUBLIC, the new folder should have Read and File Scan rights already associated with it, but you should make sure that these rights have not been changed.

- 4 (Conditional) If you want the results of the installation to be added to a status log file, make sure that the group has Write rights to that file.

A status log file records the success or failure of the installation. As each workstation completes its installation, the status log file is appended to include information on that workstation. Enable status logging in the ACU configuration file.

NOTE: If you did not create the status log file prior to running the network installation, you must give users Create and Write rights to the directory.

## Modify the ACU Configuration File

The Automatic Client Upgrade utility (ACU.EXE) determines whether the client needs to be updated and allows you to specify several installation options.

Option	Description	Settings
[LAUNCHINSTALL]	Specifies whether the platform-specific setup utility will be launched once ACU.EXE determines that the installation is necessary.	Launch=Yes   No (default: Yes)
[DISPLAYDIALOG]	Specifies whether users will be prompted to begin the upgrade.	Display=Yes   No (default: Yes)
[UNATTENDFILE]	Specifies whether a platform-specific configuration will be used and where it is located.	Use=Yes   No (default: No) File= <i>configuration file path</i>
[STATUS LOGGING]	Specifies whether a status log will be created and where it will be located.  If you did not create a status log file prior to installation, it will be created and placed in the installation directory on the network or in the directory specified in the File setting.	Use=Yes   No (default: No) File= <i>log file path</i>
[ADMINISTRATOR MESSAGE]	Specifies additional text that will appear when the user is prompted to start an ACU.	Message= <i>the message you want to appear</i>

Option	Description	Settings
[CLIENTLOCAL INSTALL]	Specifies whether the installation will be copied to a specified local directory and run locally.	<p>LocalInstall=Yes   No (default: No)</p> <p>LocalDirectory=<i>directory</i> <i>where you want the installation copied</i> (default: C:\Novell\ClientLocalInstall)</p> <p>DeleteLocalInstall=Yes   No (default: No)</p> <p>NOTE: If you want to delete the files after the installation is complete, set the DeleteLocalInstall parameter to Yes.</p>

To customize ACU:

- 1 Open the ACU.INI file located in the folder that you created on the server.
- 2 Modify the configuration options.

**IMPORTANT:** We recommend that you use the ACU.INI file instead of the command line switches used in previous versions of Novell Client. ACU.INI simplifies the installation process. If you choose to use switches, they will override ACU.INI options.

## Update the Platform-Specific Configuration Files

**NOTE:** If you are installing the client with the default settings, you do not need to create or modify the configuration files. Skip this process and proceed to [Setting Client Properties](#).

**IMPORTANT:** If you use a platform-specific configuration file to configure Novell Client, you must change the [UNATTENDEDFILE] option to Yes.

Each platform-specific installation utility reads a configuration file generated by Novell Client Install Manager in order to configure the client properties. This file provides information such as where to copy drivers during installation and the most recent version number. This file must be placed in the same folder as the installation utility.

IMPORTANT: If you are configuring Windows 95/98 workstations, options that were set in the NWSETUP.INI file or on the command line in previous versions of Novell Client (such as Display First Screen or CAB FIX) are now set up in Novell Client Install Manager.

To create a configuration file:

**1** Start Novell Client Install Manager (NCIMAN.EXE).

For Windows 95/98, Novell Client Install Manager is located in the WIN95\IBM\_ *language* \ADMIN folder that you copied to the server.

For Windows NT/2000, Novell Client Install Manager is located in the WINNT\I386\ADMIN folder that you copied to the server.

**2** Select File > New, then select the platform and click OK.

**3** Modify the installation options as needed.

**3a** In the Installation Options list box, double-click the configuration option that you want to modify.

**3b** In the property pages, set the parameters and then click OK.

The values that you set appear in the right list box.

HINT: You can import the settings from a workstation that has been previously configured and save them to the configuration file. Once you set up the workstation, select File > Import Registry to import the settings.

**4** Select File > Save.

You can use any filename—for example, UNATT\_95.TXT or UNATT\_NT.TXT.

**5** Copy this file to one of the following directories:

- ◆ WIN95\IBM\_ *language* (for Windows 95/98)
- ◆ WINNT\I386 (for Windows NT/2000)

IMPORTANT: The path to the text file cannot contain long filenames.

## Create or Modify the Login Script

You need to modify login scripts for users whose workstations will be upgraded.

- ♦ To upgrade workstations for users in a container, modify that container's login script.
- ♦ To upgrade workstations for users in a profile, modify that profile's login script.
- ♦ To upgrade specific users' workstations, modify those users' login scripts.
- ♦ To upgrade a workstation running bindery-based client software (such as Microsoft Client for NetWare Networks that ships with Windows 95 or Windows 98), edit the system login script (SYS:PUBLIC\NET\$LOG.DAT).

### Creating or Modifying a Login Script Using NetWare Administrator

To create or modify a login script using NetWare Administrator:

- 1 Start NetWare Administrator.
- 2 Using the browser, select the object whose login script you want to create or modify.
- 3 Select Object > Details > Login Script.
- 4 Enter the login script commands and information into the login script text box.

For a sample of the login script commands that you need to add to the scripts, see [“Sample Client Installation Login Script” on page 102](#).

**IMPORTANT:** Make sure you edit the sample login script to match the server names, directory paths, and specifications of your own network.

For additional information on all login script commands, see [Login Script Commands and Variables](#) in the Novell Client Online Documentation.

- 5 To save the login script and close the Details dialog box, click OK.

If the login script that you just created was a container or user login script, you're finished and the client software will be installed or updated the next time users log in.

If the login script that you just created was for a Profile object, you must associate the User object with the Profile and make the User object a trustee of the Profile object. For additional information on all login scripts, see [Creating or Modifying Login Scripts](#) in the Novell Online Client Documentation.

## Sample Client Installation Login Script

The following sample shows the commands that you add to the login script in order to install the client software from the network. The sample includes sample text for installing across an internal network.

**IMPORTANT:** In this sample, the information that is necessary to the script is represented in uppercase letters. The information that you should customize for your network is in lowercase letters.

**NOTE:** If you are using this sample script to replace the Microsoft Client with Novell Client for Windows95/98, some user intervention is necessary. Due Microsoft Client's limited scripting capabilities, users must close an open DOS box before the workstation is rebooted and the installation is completed.

```
REM ***** Windows 95/98 *****
If PLATFORM = "W95" or PLATFORM = "W98" THEN
  WRITE "Updating Novell Client for Windows 95/98."
  #\\server1\sys\public\client\win95\ibm_enu\acu.exe
  IF "%ERROR_LEVEL" = "1" THEN
    EXIT
  END
END
END

REM ***** Windows NT/2000 *****
IF PLATFORM = "WNT" THEN
  WRITE "Updating Novell Client for Windows NT/2000."
  #\\server1\sys\public\client\winnt\i386\acu.exe
  IF "%ERROR_LEVEL" = "1" THEN
    EXIT
  END
END
END
```

## What Users See

If this is a new client software installation, or if it is an upgrade from older client software, the software is installed or upgraded when users log in and restart the workstation. Users might see system messages as their workstations are upgraded, depending on how you set up the installation.

# Upgrading a Client Workstation to Windows 2000

You can upgrade a Windows 95/98 or Windows NT 4.0 workstation with Novell Client software to Windows 2000 without uninstalling the client software.

**Windows 95/98 to Windows 2000:** Installs Novell Client version 4.51 from the Windows 2000 CD.

**Windows NT to Windows 2000:** Detects the version of Novell Client software installed and does one of the following:

- ◆ If the Novell Client version is 4.6 or earlier, Windows 2000 installs the Novell Client version 4.51 from the Windows 2000 CD.
- ◆ If the Novell Client version is 4.7 or later, Windows 2000 leaves it in tact but removes all installed components and changes the protocol selection.

After the migration to Windows 2000 is complete, Novell Client will reinstall the previously installed components and restore the previously selected protocols.

**WARNING:** In order to complete the reinstallation of the components and protocols, the user who logs in to the workstation after the migration must have Administrator rights.

Novell Client version 4.51 on the Windows 2000 CD has limited functionality. Therefore, you will want to upgrade to the latest Novell Client version once you have completed the upgrade. You can either access the latest client software from a product CD or download it from [www.novell.com/download](http://www.novell.com/download). Once you have set up the Automatic Client Upgrade (see [“Installing Clients from the Network” on page 96](#)), Novell Client will run an ACU from one of the following places:

- ◆ The path pointed to by the NWCLIENTDIR environment variable in the login script or at the command line
- ◆ The path where Novell Client was installed from
- ◆ Drive Z: on the network

You may choose to skip the Automatic Client Upgrade by setting the NWCLIENTDIR environment variable to NULL in the login script.

For more information on Automatic Client Upgrade, see [“Installing Clients from the Network”](#) on page 96.

For more information on installing Novell Client on individual workstations, see [“Installing Clients from CD-ROM”](#) on page 94.



# 5

## Install Networking Products

This chapter describes the networking products that are available with NetWare 5.1<sup>®</sup>, and how to install and use them.

NOTE: For additional information about setting up, configuring, or using these products and services, see the NetWare 5.1 documentation, located on the Novell Documentation CD or at <http://www.novell.com/documentation>.

### **New Products and Services**

- ◆ NetWare Enterprise Web Server
- ◆ NetWare News Server
- ◆ NetWare Web Manager
- ◆ NetWare Web Search Server
- ◆ NetWare MultiMedia Server
- ◆ IBM\* WebSphere\* Application Server

### **Traditional Products and Services**

- ◆ Novell<sup>®</sup> Distributed Print Services<sup>™</sup>
- ◆ LDAP for NDS<sup>®</sup>
- ◆ NetWare FTP Server
- ◆ Novell DNS/DHCP Services
- ◆ Catalog Services
- ◆ WAN Traffic Manager Services

## Network Administration Tools

- ◆ ConsoleOne™
- ◆ NetWare Administrator
- ◆ NetWare Management Portal™
- ◆ NDS Manager™
- ◆ Novell Licensing Services

## New Products and Services

NetWare 5.1 includes several new products and services that provide functionality that has traditionally been associated only with the Internet. These NetWare products will add tremendous value to your company's network, your Internet Web site, or both.

### NetWare Enterprise Web Server

NetWare Enterprise Web Server allows you to add Web-server functionality to your NetWare server. NetWare Enterprise Web Server allows your NetWare server to use the HTTP protocol to store Web information and provide Web pages to clients, such as Web browsers.

You can use NetWare Enterprise Web Server to create Web sites that are available to the entire Internet or only to users on your network.

To install NetWare Enterprise Web Server *during* the NetWare 5.1 server installation:

- 1 From the Installation Options screen, select Custom.
- 2 From the Components screen, check the check box for NetWare Enterprise Web Server.
- 3 Follow the on-screen instructions.

To install NetWare Enterprise Web Server software *after* the NetWare 5.1 server installation:

- 1 At the NetWare server console, access the servertop by entering **STARTX**.
- 2 Click Novell > Install > Add.

- 3 Specify the path to the NetWare Enterprise Web Server files. (NetWare Enterprise Web Server files are located on the NetWare 5.1 Operating System CD in the PRODUCTS\NOVONYX directory.)

NOTE: To access the CD, you may need to enter **CDROM** at the server console.

- 4 Follow the on-screen instructions to complete the installation.

To configure NetWare Enterprise Web server, use NetWare Web Manager.

## NetWare News Server

NetWare News Server allows you to provide newsgroup and discussion group functionality on your NetWare network. You can provide discussion groups for all of your users on the Internet, on your internal network, or both. Newsgroups are accessed and read using a standard Web browser, such as Netscape\* Navigator\* or Internet Explorer.

To install NetWare News Server *during* the NetWare 5.1 server installation:

- 1 From the Installation Options screen, select Custom.
- 2 From the Components screen, check the check box for NetWare News Server.
- 3 Follow the on-screen instructions.

To install NetWare News Server *after* the NetWare 5.1 server installation:

- 1 At the NetWare server console, access the servertop by entering **STARTX**.
- 2 Click Novell > Install > Add.
- 3 Specify the path to the NetWare News Server files. (NetWare News Server files are located on the NetWare 5.1 Operating System CD in the PRODUCTS\NOVONYX directory.)

NOTE: To access the CD, you may need to enter **CDROM** at the server console.

- 4 Follow the on-screen instructions to complete the installation.

To set up and configure NetWare News Server, use NetWare Web Manager.

## NetWare Web Manager

NetWare Web Manager allows you to use a Web browser to manage Web browser-based services available with NetWare 5.1, such as NetWare News Server, NetWare Enterprise Web Server, and NetWare MultiMedia Server.

To install NetWare Web Manager *during* the NetWare 5.1 server installation:

- 1 From the Installation Options screen, select Custom.
- 2 From the Components screen, check the check box for NetWare Web Manager.
- 3 Follow the on-screen instructions.

IMPORTANT: Record the port number for NetWare Web Manager.

To install the NetWare Web Manager software *after* the NetWare 5.1 server installation:

- 1 At the NetWare server console, access the server top by entering **STARTX**.
- 2 Click Novell > Install > Add.
- 3 Specify the path to the NetWare News Server files. (NetWare News Server files are located on the NetWare 5.1 Operating System CD in the PRODUCTS\NOVONYX directory.)

NOTE: To access the CD, you may need to enter **CDROM** at the server console.

- 4 Follow the on-screen instructions to complete the installation.

IMPORTANT: Record the port number for NetWare Web Manager.

To access NetWare Web Manager:

- 1 Launch a Web browser from a Windows\* workstation.
- 2 Enter the following information in the Location or URL field:

***https://<server IP address>:<NetWare Web Manager port number>***

NOTE: You do not need the "s" on the end of http if you don't require secure data transmission.

## NetWare Web Search

NetWare Web Search helps you create indexes for adding search capability to your Internet or intranet Web sites. NetWare Web Search can index files and documents located on NetWare servers and other Web servers.

To install NetWare Web Search *during* the NetWare 5.1 server installation:

- 1 From the Installation Options screen, select Custom.
- 2 From the Components screen, check the check box for NetWare Web Search.
- 3 Follow the on-screen instructions.

To install NetWare Web Search *after* the NetWare 5.1 server installation:

- 1 At the NetWare server console, access the servertop by entering **STARTX**.
- 2 Click Novell > Install > Add.
- 3 Specify the path to the NetWare Web Search files. (NetWare Web Search files are located on the NetWare 5.1 Operating System CD in the PRODUCTS\NSEARCH directory.)

NOTE: To access the CD, you may need to enter **CDROM** at the server console.

- 4 Follow the on-screen instructions to complete the installation.

To make sure that NetWare Web Search is available:

- 1 Launch a Web browser from a Windows workstation.
- 2 Enter the following information in the Location or URL field:  
`http://<server IP address>/NOVELLSEARCH`
- 3 When the default search form appears, enter a word or phrase.
- 4 Click Search.

To set up and configure NetWare Web Search, use NetWare Web Manager.

## NetWare MultiMedia Server

NetWare MultiMedia Server adds functionality to your NetWare 5.1 server, enabling it to store and deliver streaming multimedia files to anyone accessing the data with a Web browser.

To install NetWare MultiMedia Server *during* the NetWare 5.1 server installation:

- 1 From the Installation Options screen, select Custom.
- 2 From the Components screen, check the check box for NetWare MultiMedia Server.
- 3 Follow the on-screen instructions.

To install NetWare MultiMedia Server *after* the NetWare 5.1 server installation:

- 1 At the NetWare server console, access the servertop by entering **STARTX**.
- 2 Click Novell > Install > Add.
- 3 Specify the path to the NetWare MultiMedia files. (NetWare Web Search files are located on the NetWare 5.1 Operating System CD in the PRODUCTS\MMSERVER directory.)

NOTE: To access the CD, you may need to enter **CDROM** at the server console.

- 4 Follow the on-screen instructions to complete the installation.

To set up and configure NetWare MultiMedia Server, use NetWare Web Manager.

## IBM WebSphere Application Server

IBM WebSphere for NetWare provides an environment to deploy and manage Java\* applications on a NetWare server. You can use WebSphere to build, run, and manage e-commerce applications on your NetWare 5.1 server.

To set up IBM WebSphere Application Server *during* the NetWare 5.1 server installation.

- 1 From the Installation Options screen, select Custom.
- 2 From the Components screen, check the check box for NetWare MultiMedia Server.
- 3 Check the check box for IBM WebSphere Application Server.

- 4 Complete the NetWare 5.1 server installation by following the on-screen instructions.
- 5 (Optional) Install Oracle8\*. You must have the Oracle\* database installed to run the sample applications. (The Oracle8 installation files are located on the Oracle CD.)

To install IBM WebSphere Application Server *after* the NetWare 5.1 server installation.

- 1 At the NetWare server console, access the servertop by entering **STARTX**.
- 2 Click Novell > Install > Add.
- 3 Specify the path to the IBM Websphere Application Server files. (IBM Websphere Application Server files are located on the NetWare 5.1 Operating System CD in the PRODUCTS\WAS directory.)  
  
NOTE: To access the CD, you may need to enter **CDROM** at the server console.
- 4 Follow the on-screen instructions to complete the installation.
- 5 (Optional) Install Oracle8. You must have the Oracle database installed in order to run the sample applications. (The Oracle8 installation files are located on the Oracle CD.)

For more information, see the [IBM WebSphere for NetWare Web site \(http://developer.novell.com/ndk/ibmws.htm\)](http://developer.novell.com/ndk/ibmws.htm).

## Traditional Products and Services

NetWare 5.1 includes many products and services that add value to your network. This section provides descriptions and instructions for setting up a few of the key traditional products that are available with NetWare 5.1.

### Novell Distributed Print Services

Novell Distributed Print Services (NDPS<sup>®</sup>) helps you set up and manage printers.

To install NDPS *during* the NetWare 5.1 server installation:

- 1 From the Installation Options screen, select Custom.
- 2 From the Components screen, check the check box for Novell Distributed Print Services.

- 3 Complete the NetWare 5.1 server installation by following the on-screen instructions.

To install NDPS *after* the NetWare 5.1 server installation:

- 1 At the NetWare server console, access the servertop by entering **STARTX**.
- 2 Click Novell > Install > Add.
- 3 Specify the path to the NDPS files. (NDPS is located on the NetWare 5.1 Operating System CD in the PRODUCTS\NDPS directory.)
- 4 Follow the on-screen instructions to complete the NDPS installation.

To set up and configure NDPS:

- 1 From a Windows 95/98 or Windows NT\* workstation, log in to the network.
- 2 Run NetWare Administrator. (NWADMN32.EXE is located in the SYS:PUBLIC\WIN32 directory.)
- 3 Create an NDPS Manager.
- 4 Create an NDPS printer.
- 5 (Conditional) If legacy clients still require print queues, configure the NDPS printer to service jobs submitted to traditional print queues.

## LDAP Services for NDS

LDAP Services for NDS allows clients to use the LDAP (Lightweight Directory Access Protocol) protocol to access information stored in NDS.

For example, you could use LDAP Services for NDS to provide external customers with a directory of your employees. Using a Web browser, the external customers could browse through whatever information you allow them to access.

After installing the NetWare 5.1 server, verify that [Public] has rights to receive LDAP Directory or NDS information.

To verify or grant rights to [Public]:

- 1 From a Windows 95/98 or Windows NT workstation, log in to the network.
- 2 Run NetWare Administrator. (NWADMN32.EXE is located in the SYS:PUBLIC\WIN32 directory.)



- 3 From NetWare Administrator, right-click on the highest container object that the LDAP client will be allowed to access with a browser. For example, to grant access to the entire tree, right-click on the [Root] object of the tree.
- 4 Select Trustees of this Object.
- 5 Add [Public] as a new trustee.
- 6 In Object Rights, check Browse.
- 7 In Property Rights, select All Properties, then check Compare and Read.

For more information, see the [LDAP Services for NDS Web site \(http://www.novell.com/products/nds/ldap.html\)](http://www.novell.com/products/nds/ldap.html).

## NetWare FTP Server

NetWare FTP Server provides File Transfer Protocol (FTP) service for transferring files between any FTP clients. Adding FTP functionality to your NetWare server will allow you log in to the NDS tree using any FTP client. After logging in to the NDS tree, you can navigate to other NetWare servers

To install NetWare FTP Server *during* the server installation:

- 1 From the Installation Options screen, select Custom.
- 2 From the Components screen, check the check box for NetWare FTP Server.
- 3 Follow the on-screen instructions to complete the NetWare 5.1 server installation.

To install NetWare FTP Server *after* the NetWare 5.1 server installation:

- 1 At the NetWare server console, access the servertop by entering **STARTX**.
- 2 Click Novell > Install > Add.
- 3 Specify the path to the FTP Server files. (FTP Server files are located on the NetWare 5.1 Operating System CD in the PRODUCTS\FTP directory.)

NOTE: To access the CD, you may need to enter **CDROM** at the server console.

- 4 Follow the on-screen instructions to complete the installation.

## Novell DNS/DHCP Services

Novell DNS/DHCP Services integrates the Domain Name System (DNS) and Dynamic Host Configuration Protocol (DHCP) into the NDS database. Integrating these services into NDS provides centralized administration and enterprise-wide management of network (IP) addresses, configurations, and hostnames.

Integrating DNS with NDS greatly simplifies the task of network administration by enabling you to enter all configuration information into one distributed database. The DNS configuration information is replicated just like any other data in NDS.

A NetWare DHCP server automatically assigns IP addresses and other configuration information to clients upon request or when the clients are restarted. Automatic assignment of configuration information reduces the amount of work required to configure and manage a large IP network.

To add Novell DNS/DHCP Services *during* the NetWare 5.1 server installation:

- 1 From the Installation Options screen, select Custom.
- 2 From the Components screen, check the check box for Novell DNS/DHCP Services.
- 3 Complete the NetWare 5.1 server installation following the on-screen instructions.

To add Novell DNS/DHCP Services *after* the NetWare 5.1 server installation:

- 1 At the NetWare server console, access the servertop by entering **STARTX**.
- 2 Click Novell > Install > Add.
- 3 Specify the path to the Novell DNS/DHCP Services files. (Novell DNS/DHCP Services files are located on the NetWare 5.1 Operating System CD in the PRODUCTS\DNIP directory.)

NOTE: To access the CD, you may need to enter **CDROM** at the server console.

- 4 Follow the on-screen instructions to complete the installation.

To set up and configure Novell DNS/DHCP Services:

- 1** From a Windows 95/98 or Windows NT workstation, log in to the network.
- 2** Run `SYS:PUBLIC\DNSDHCP\SETUP.EXE` to install the DNS/DHCP Management Console.
- 3** (Conditional) Use DNS/DHCP Management Console to import DHCP information.
- 4** Set up DHCP.
  - 4a** From DNS/DHCP Management Console, select DHCP Service.
  - 4b** Click the Global Preferences icon.
  - 4c** Click Global DHCP Options > Modify.
  - 4d** Select the desired options and provide the required information.
  - 4e** Enter or browse for the desired server and click Create > Subnet > OK.
  - 4f** Select the Subnet to create Subnet Address Range objects under, then click Create.
  - 4g** Select the Subnet to create IP Address objects under, then click Create.
  - 4h** Enter the IP Address to be assigned or excluded, then select Assignment Type > Create.
- 5** Load DHCP by entering `DHCPSERVER` at the NetWare server console.
- 6** Load DNS by entering `NAMED` at the NetWare server console.

## Catalog Services

Catalog Services, an option available only for NDS 7, lets administrators and applications create catalogs of frequently accessed NDS objects. Catalog Services is designed to provide faster access to information in the NDS database and provide enhanced search capabilities.

NOTE: The functionality of Catalog Services is integrated with NDS 8. If you are installing NDS 8, the option to install Catalog Services will be unavailable.

A *catalog* is an NDS object that stores information from the NDS database. The catalog stores only objects and properties that you specify, and lets you find information about those objects without a time-consuming search of the entire NDS tree.

A catalog can contain information from an entire NDS tree or from a portion of the tree. For example, you can create a catalog of all users with their complete names and their telephone numbers. The catalog is stored as an NDS object and provides rapid access to selected NDS data. Catalog objects are created, used, and managed using NetWare Administrator. You can update a catalog as needed or schedule periodic, automatic updates.

To install Catalog Services *during* the NetWare 5.1 server installation:

- 1 From the Installation Options screen, select Custom.
- 2 From the Components screen, check the check box for Catalog Services.
- 3 Complete the NetWare 5.1 server installation by following the on-screen instructions.

To install Catalog Services software *after* the NetWare 5.1 server installation:

- 1 At the NetWare server console, access the servertop by entering **STARTX**.
- 2 Click Novell > Install > Add.
- 3 Specify the path to the Catalog Services installation files. (Catalog Services files are located on the NetWare 5.1 Operating System CD in the PRODUCTS\CATALOG directory.)

NOTE: To access the CD, you may need to enter **CDROM** at the server console.

- 4 Follow the on-screen instructions to complete the installation.

To set up Catalog Services:

- 1 Make sure that your NetWare 5.1 server is running NDS version 7.

NOTE: To check the NDS version, enter **VERSION** at the server console.

- 2 Load the Catalog Services NLM™ (the dredger) by entering **dscat** at the NetWare server console.

## WAN Traffic Manager Services

WAN Traffic Manager controls the communication of select NDS events between NetWare servers. It lets you define when you want to synchronize NDS replica data between servers, thus reducing unnecessary traffic across your WAN links.

You could use WAN Traffic Manager to schedule synchronization of the NDS replica at a remote site. By scheduling when synchronization occurs, you can synchronize your NDS replica data when network bandwidth is available and communication costs are low.

To set up WAN Traffic Manager:

- ◆ During the NetWare 5.1 server installation, check the check box for WAN Traffic Manager.
- ◆ After the installation is complete, you need to load the WAN Traffic Manager NLM by entering **wtm** on each participating NetWare server.
- ◆ Use NetWare Administrator or ConsoleOne to configure WAN Traffic Manager.

## Network Administration Tools

NetWare 5.1 provides you with a variety of tools for managing your network. This section describes some of the tools that are available and how to use them.

### ConsoleOne

ConsoleOne runs either on a Windows workstation or on the server console, and lets you view and manage your NDS network resources. You can use ConsoleOne to create and manage NDS objects for users, groups, servers, files, and directories.

After you install NetWare 5.1, you can use ConsoleOne to create users. In addition to managing NDS objects, you can use ConsoleOne from your Windows workstation to establish a remote console session with a NetWare server.

To run ConsoleOne on a Windows 95/98 or Windows NT workstation:

- 1 Make sure that your workstation is running the Novell Client™ software available with NetWare 5.1.
- 2 At the workstation, map a network drive to SYS:PUBLIC\MGMT\CONSOLEONE\BIN on a NetWare 5.1 server.
- 3 Run CONSOLEONE.EXE.

To run ConsoleOne on a NetWare server, do one of the following:

- ◆ If the servertop (GUI interface) is running on the server, click Novell > Programs > ConsoleOne.
- ◆ If the servertop is not running, enter **C1START** at the server console.

## NetWare Administrator

NetWare Administrator is used to create and manage NDS objects on your network. Use NetWare Administrator to create users and home directories for each user.

To run NetWare Administrator:

- 1 From a Windows 95/98 or Windows NT workstation, log in to the network.
- 2 Map a drive to SYS:PUBLIC\WIN32 on a NetWare 5.1 server.
- 3 Run NWADMN32.EXE.

## NetWare Management Portal

NetWare Management Portal enables you to use a Web browser to manage NetWare servers from a Windows workstation.

You can use NetWare Management Portal for typical server management tasks such as mounting and dismounting volumes, managing server connections, and configuring SET parameters. You can also check the general health status of servers, access files on volumes and DOS partitions, and monitor the health of many server processes and resources.

To access NetWare Management Portal:

- 1 Launch a Web browser from a Windows workstation.
- 2 Enter the following information in the Location or URL field:

**`http://<NetWare server IP address>:8008`**

NOTE: If NetWare Enterprise Web Server is not installed on your NetWare server, you do not need to add the port number (8008) after the IP address.

- 3 Click Login. Log in as Admin or an administrator equivalent to gain access to all the features and functions.

## NDS Manager

NDS Manager allows you to create and manage NDS partitions and replicas from a Windows 95/98 or Windows NT workstation.

If your network is not centrally located, you could use NDS Manager to create a replica of the NDS information relating to each remote site. Because users access their own local NDS replica, they do not access the NDS information at the central location. Network users get faster network performance by accessing their own local NDS replica.

To run NDS Manager:

- 1 From a Windows 95/98 or Windows NT workstation, log in to the network.
- 2 Map a drive to SYS:PUBLIC\WIN32 on a NetWare 5.1 server.
- 3 Run NDSMGR32.EXE.

For more information on NDS Manager, see the NDS Manager online help.

## Novell Licensing Services

Novell Licensing Services (NLS) keeps track of how many valid licenses are available for specific software programs on your network. You can find out whether your company needs to buy more software licenses, or whether your company requires fewer software licenses.

Novell Licensing Services, combined with ZENworks™, enables you to use software metering to monitor the usage of specific software programs or files on your network—even if the program is not NLS-enabled. Using NLS, you can uncover how many times a specific file has been opened in the past week or how many users are currently using it.

To view license information on your network:

- 1 From a Windows 95/98 or Windows NT workstation, log in to the network.
- 2 Map a drive to SYS:PUBLIC\WIN32 on a NetWare 5.1 server.
- 3 Run NWADMN32.EXE.
- 4 Double-click a specific License Certificate object.
- 5 (Optional) Select Tools > Novell Licensing Services > Generate Reports to view all License Certificate objects on your network.

## Summary

For complete information on these products and services—and the many more products and services that are available with NetWare 5.1—see:

- ♦ The NetWare 5.1 Online Documentation CD included with the NetWare 5.1 product.
- ♦ The [Novell Product Documentation Web site \(http://www.novell.com/documentation\)](http://www.novell.com/documentation).
- ♦ The [NetWare Deployment Web site \(http://www.novell.com/deployment\)](http://www.novell.com/deployment).