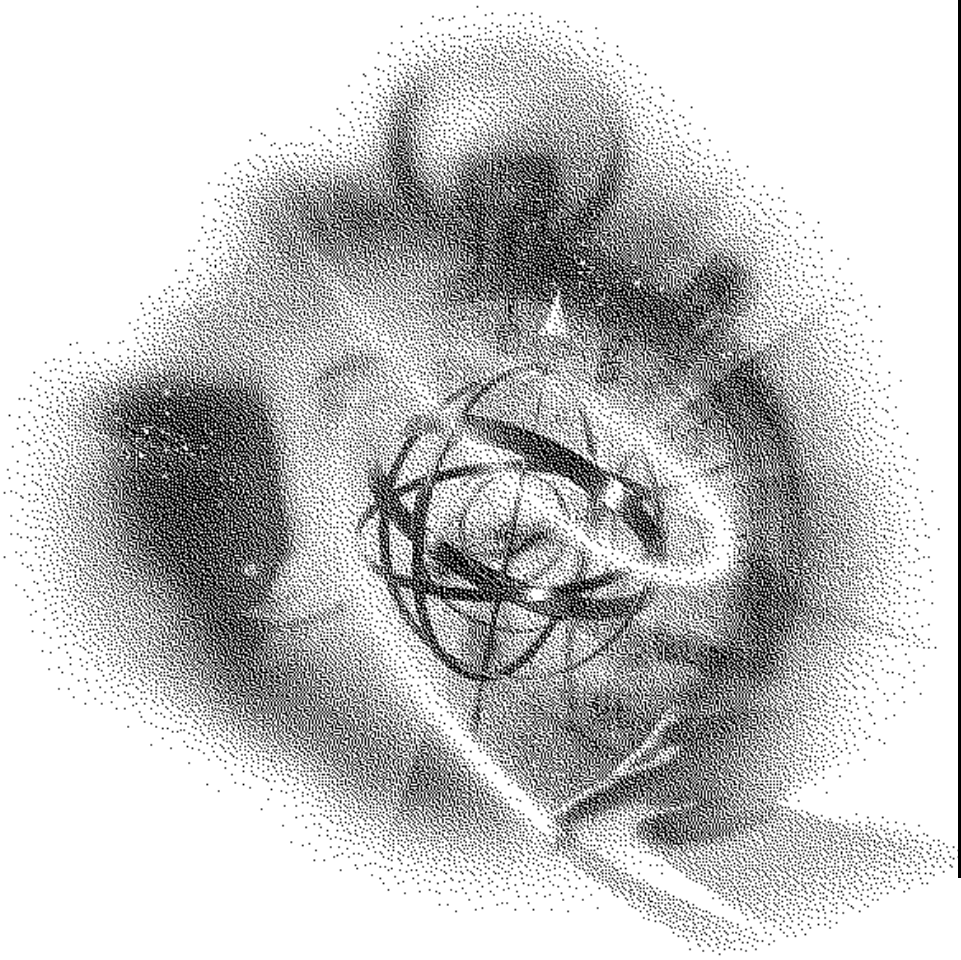
VERSION 4.11

Upgrade



NetWare® 4™
NETWORK SOFTWARE

Novell®

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U.S. Patent Nos. 5,157,663; 5,349,642; and 5,455,932. U.S. and International Patent Pending.

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Contents

3 Upgrade Across-the-Wire Using the DS Migrate Utility

4 Upgrade Using “Across-the-Wire” Option of MIGRATE.EXE

5 Upgrade Using "Same-Server" Option of MIGRATE.EXE

A Calculate RAM Requirements

B Name Space Requirements

C NetWare 4 File and Directory Attributes

D Upgrade Across a LAN/WAN Using RCONSOLE

E Importing User Data Into NDS Using UIMPORT

Trademarks

Index

User Comments

How to Use This Manual

Contents Overview

In Novell® documentation, an asterisk denotes a trademarked name belonging to a third-party company. Novell trademarks are denoted with specific trademark symbols, such as ™.

Chapter 1: Upgrade Options

This chapter describes the four ways to upgrade to NetWare® 4.11. It also gives recommendations on which upgrade method to use depending on your individual situation.

Chapter 2: Upgrade Using INSTALL.NLM

This chapter explains how to upgrade an existing NetWare 3™ or NetWare 4™ server to NetWare 4.11 using INSTALL.NLM.

Chapter 3: Upgrade Across-the-Wire Using the DS Migrate Utility

This chapter explains how to upgrade existing NetWare 2 and 3, and operating systems servers to NetWare 4.11 using the DS Migrate utility and the NetWare File Migration utility (for NetWare 3 servers), or DS Migrate and the MIGRATE.EXE utility (for NetWare 2 servers).

Chapter 4: Upgrade Using “Across-the-Wire” Option of MIGRATE.EXE

This chapter gives instructions on how to upgrade NetWare 2, NetWare 3, or other network operating system servers to NetWare 4.11 using the “Across-the-Wire” option in the MIGRATE.EXE utility.

Chapter 5: Upgrade Using “Same-Server” Option of MIGRATE.EXE

This chapter gives instructions on how to upgrade NetWare 2, NetWare 3, or other network operating system servers to NetWare 4.11 using the “Same-Server” option in the MIGRATE.EXE utility.

Appendix A: Calculate RAM Requirements

This appendix provides a detailed formula for calculating your NetWare 4.11 RAM requirements.

Appendix B: Name Space Requirements

This appendix provides detailed information on name spaces and how to best utilize your server RAM when loading name spaces.

Appendix C: NetWare 4 File and Directory Attributes

This appendix describes the new file and directory attributes unique to NetWare 4.

Appendix D: Upgrade Across a LAN/WAN Using RCONSOLE

This appendix presents a method for administrators of LAN and WAN networks to upgrade NetWare 3.1*x* and 4.*x* servers to NetWare 4.11 from a central location using RCONSOLE.

Appendix E: Importing User Data Into NDS Using UIMPORT

This appendix presents information on importing data from an existing database into the NetWare Directory Services™ (NDS) database using the UIMPORT utility.

User Comments

We are continually looking for ways to make our products and our documentation as easy to use as possible.

You can help us by sharing your comments and suggestions about how our documentation could be made more useful to you and about inaccuracies or information gaps it might contain.

Submit your comments by using the User Comments form provided or by writing to us directly at the following address:

Novell, Inc.
Documentation Development MS C-23-1
122 East 1700 South
Provo, UT 84606 USA

We appreciate your comments.

chapter 1

Upgrade Options

Overview

Novell® supplies a number of options for upgrading earlier versions of the NetWare® operating system (NetWare 2, NetWare 3™, and NetWare 4™) to NetWare 4.11. The upgrade option you use is dependent on a number or variables which include

- Your present version of NetWare
- Your hardware, including servers and clients
- Your intention of maintaining an existing server, or migrating bindery and data to a new server

Upgrade Methods

This manual includes complete step-by step instructions for upgrading your NetWare operating system using any of the following options:

- Upgrade Using INSTALL.NLM

  This is for those who have an existing NetWare 3.1*x* server and want to upgrade the server computer itself to a NetWare 4.11 server.

- Upgrade Across-the-Wire Using the DS Migrate* Utility

  This is for those who have an existing NetWare 2.1*x*, 2.2, or 3.1*x* server and want to migrate the server bindery and data across-the-wire to an existing NetWare 4.11 server using a GUI utility.

  This option allows you to see and refine a model of your updated Directory tree before completing its migration.

- Upgrade Using the “Across-the-Wire” Option of MIGRATE.EXE

  Like the DS Migrate utility option, this allows you to migrate NetWare 2.1*x*, 2.2, or 3.1*x* server bindery and data files across-the-wire.

  This option does not include modeling capabilities and is done through a text-based user interface rather than a GUI.

  This option is included for those users who are already familiar with the MIGRATE.EXE utility from previous versions of NetWare, and for users who must migrate NetWare 2.1*x* or 2.2 data.

- Upgrade Using the “Same-Server” Option of MIGRATE.EXE

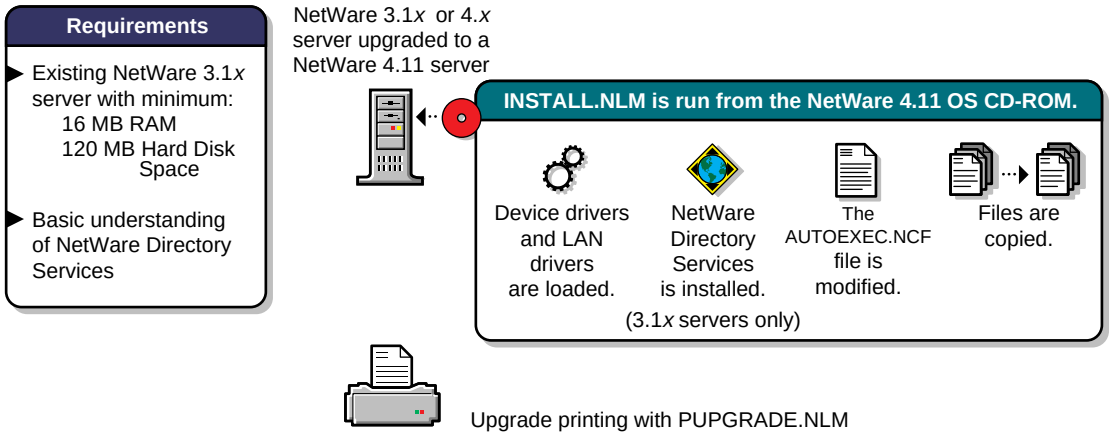
  This is for those who have an existing NetWare 2.1*x*, 2.2 or 3.1*x* server, who want to upgrade the server computer itself to a NetWare 4.11 server, but cannot use INSTALL.NLM because one of the following is true for the existing system:

  - The server is a NetWare 2.1*x* or 2.2 server (NetWare 2 servers cannot load INSTALL.NLM)
  - The volume SYS: is too small (NetWare 4.11 requires a minimum volume SYS: of 90 MB)
  - The DOS partition is too small (NetWare 4.11 requires a minimum DOS partition of 15 MB)
  - Any hardware modifications have to be made to the server

Each method is diagrammed below.

Figure 1-1

How Upgrading Using INSTALL.NLM Works



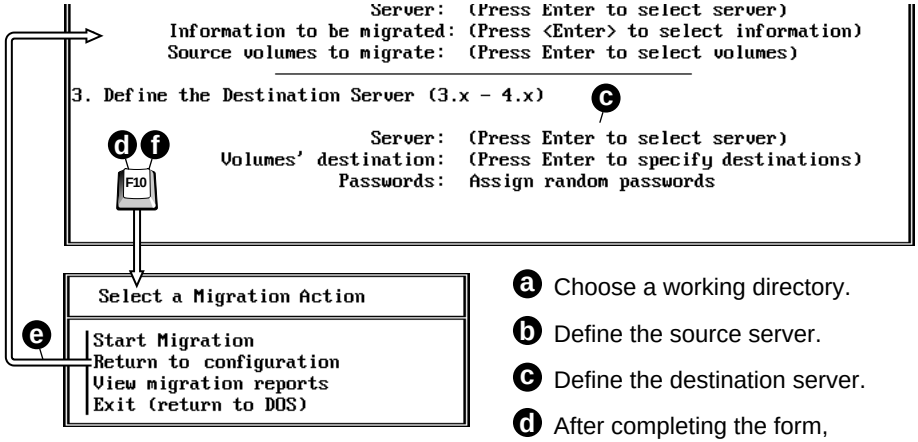
This option allows you to maintain the NetWare 3.1*x* or 4.*x* computer as a server by upgrading the operating system to NetWare 4.11.

If you are upgrading from a NetWare 3.1*x* server, the server is placed in a context within a NetWare 4 Directory tree.

NetWare 4.11 requires a Volume SYS: of at least 90 MB. If your NetWare 3.1*x* or 4.*x* server's volume SYS: is smaller than 90 MB, and you want to maintain the computer as a server, you must perform a Same-Server Migration (see Chapter 5, "Upgrade Using "Same-Server" Option of MIGRATE.EXE" on page 103).

Figure 1-2

How Upgrading Across-the-Wire Using the DS Migrate Utility Works



a. Choose a working directory.

b. Define the source server.

c. Define the destination server.

d. After completing the form, press <F10> to display the "Select a Migration Action" menu.

e. If any changes are necessary, choose "Return to Configuration" from the menu.

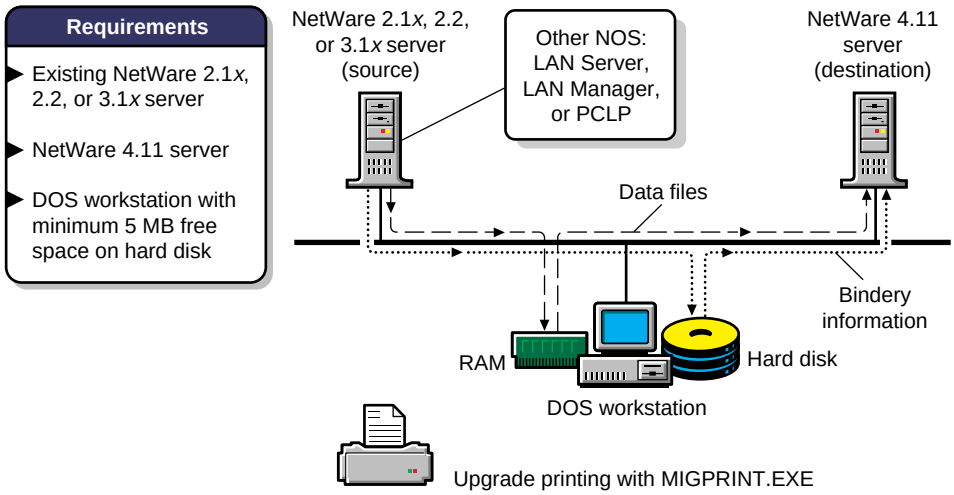
f. After changes are made, press <F10>. Choose an action and press <Enter>.

This option allows you to first migrate the existing NetWare 2.1*x*, 2.2 or 3.1*x* bindery using the new DS Migrate utility.

Then, migrate the server files using MIGRATE.EXE (for NetWare 2.1*x*, or 2.2 servers) or the new NetWare File Migration utility (for NetWare 3.1x servers).

Figure 1-3

How Upgrading Using the "Across-the-Wire" Option of MIGRATE.EXE Works



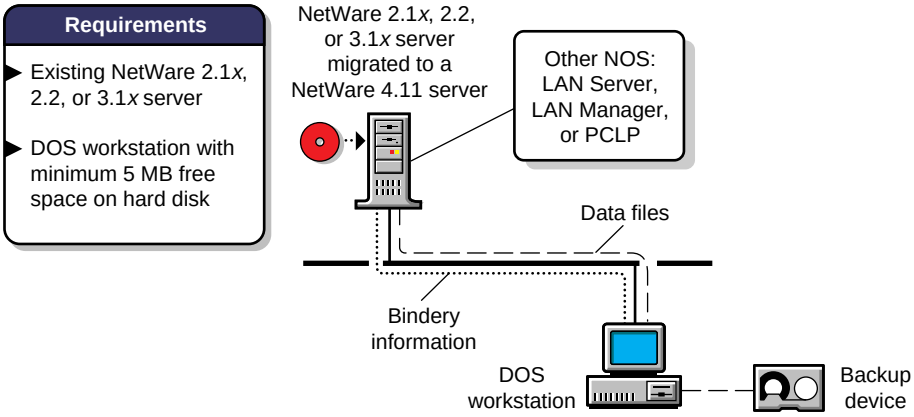
This option allows you to migrate existing NetWare 2.1*x* or 3.1*x* bindery and data using the MIGRATE.EXE DOS utility.

The bindery is migrated to a DOS workstation where it is stored temporarily on the workstation's hard disk. The server files are migrated directly to the NetWare 4.11 server.

Once all files have been migrated, the bindery is copied to the NetWare 4.11 server where it becomes part of the NetWare 4 Directory tree.

Figure 1-4

How Upgrading Using the "Same-Server" Option of MIGRATE.EXE Works



Once your NetWare server files have been backed up to a backup device, this option allows you to use MIGRATE.EXE to migrate your NetWare 2.1*x* or 3.1*x* server bindery so you can then install the NetWare 4.11 operating system on your server.

Once the NetWare 4.11 operating system is installed, you restore the files and then use MIGRATE.EXE to migrate the bindery back to the upgraded server. The bindery information becomes part of the new NetWare 4 Directory tree.

Other Upgrade Options

The options discussed above are the principal options used to upgrade to the NetWare 4.11 operating system. Novell continues to provide and support other network operating system upgrade options. These include:

- A solution for upgrading NetWare 3 and 4 LANs and WANs using RCONSOLE (see Appendix D, "Upgrade Across a LAN / WAN Using RCONSOLE," on page 145).
- An in-place upgrade option for upgrading a NetWare 2 server to NetWare 4.11 using the 2XUPGRDE.NLM (available on NetWire®).
- The UIMPORT utility. This is provided to allow you to import directory information from another database to NetWare Directory Services (NDS).
- Tools for migrating non-NetWare operating systems to NetWare 4.11 (available through Novell Consulting).
- Additional upgrading tips and ideas (available through Novell Consulting).

  Via the internet:

  http://www.novell.com/corp/programs/ncs/toolkit/main.html

  Or by e-mail:

  solution@novell.com

  Or by phone:

  800-453-1267 (extension 5387) or 801-861-5387

Where to Go from Here

If you want to	Go to
Upgrade using INSTALL.NLM	Chapter 2, "Upgrade Using INSTALL.NLM," on page 9.

If you want to	Go to
Upgrade using DS Migrate	Chapter 3, “Upgrade Across-the-Wire Using the DS Migrate Utility,” on page 55.
Upgrade using the “Across-the-Wire” option of MIGRATE.EXE	Chapter 4, “Upgrade Using “Across-the-Wire” Option of MIGRATE.EXE,” on page 77.
Upgrade using the “Same-Server” option of MIGRATE.EXE	Chapter 5, “Upgrade Using "Same-Server" Option of MIGRATE.EXE,” on page 103.
Upgrade remote servers from a central location	Appendix D, “Upgrade Across a LAN/WAN Using RCONSOLE,” on page 145.
Upgrade by importing directory information from another database	Appendix E, “Importing User Data Into NDS Using UIMPORT,” on page 161.

chapter 2

Upgrade Using INSTALL.NLM

Overview

You can use INSTALL.NLM, along with the NetWare® 4.11 *Operating System* CD-ROM, to upgrade your existing NetWare 3.1*x* or 4.*x* server to the NetWare 4.11 operating system.

This option allows you to update your server with new operating system and boot files, and, if upgrading from a 3.*x* server, transform your bindery information into a NetWare Directory Services™ (NDS) structure.

Note For a graphical look at how the upgrade using INSTALL.NLM works, see Figure 1-1 on page 3.

How It Works

Using the "Upgrade NetWare 3.1*x* or 4.*x*" option of INSTALL.NLM, the server is upgraded to NetWare 4.11 through the following:

- Device drivers and LAN drivers for the new NetWare 4.11 operating system are loaded.
- (Conditional) NetWare Directory Services (NDS) is installed or upgraded (see "Check Your NetWare Directory Services Version" on page 10).
- The AUTOEXEC.NCF file is modified.
- The NetWare 4.11 files are copied to the server.
- Printing is upgraded using PUPGRADE.NLM.

Prepare the Server for Upgrade

Necessary Resources

- ❑ NetWare 3.1*x* or 4.*x* server. This is the server you upgrade.
- ❑ NetWare 4.11 *Operating System* CD-ROM.
- ❑ CD-ROM drive installed on the server being upgraded, the *Operating System* CD-ROM mounted as a NetWare volume, or the CD-ROM files copied to another server.
- ❑ Minimum 20 MB of RAM on the server.

To determine how much RAM your server should have, refer to Appendix A, “Calculate RAM Requirements,” on page 123.

- ❑ Minimum 90 MB Volume SYS: on the server.
- ❑ Minimum 15 MB DOS partition on the server.

Check Your NetWare Directory Services Version

The NDS base schema has been modified in NetWare 4.11. The new schema is compatible with DS.NLM version 4.89 or later, and the DS.NLM versions supported in NetWare 4.02

You can check which version of DS.NLM you are loading by going to the server console and typing

MODULES <Enter>

A sample might appear as follows:

```
DS.NLM
  NetWare 4.1 Directory Services
  Version 4.94 December 14, 1995
  Copyright 1993-1996 Novell, Inc. All rights
   reserved.
```

The sample above indicates that the NetWare 4.1 server is using DS.NLM version 4.94.

If	Then
You are upgrading a NetWare 3.1*x* server	Continue with “Prerequisites.”
You are upgrading a NetWare 4 server that is loading DS.NLM version 4.89 or later	Continue with “Prerequisites.”
You are upgrading a NetWare 4.0*x* server	On the NetWare 4.11 *Operating System* CD-ROM, go to the PRODUCTS\NW402*language* and refer to the instructions in the READUPGD.TXT and DSREPAIR.DOC files. Continue with “Prerequisites.”
You are upgrading a NetWare 4.1 server that is running a DS.NLM version prior to 4.89	On the NetWare 4.11 *Operating System* CD-ROM, go to the PRODUCTS\NW410*language* directory and refer to the instructions in the READUPDS.TXT file. Continue with the “Prerequisites.”

Important

To avoid NDS base schema conflicts, always upgrade the server holding the master replica of the [Root] partition first.

Prerequisites

Checklist

- ❏ (Optional) Use the NetWare 3.1*x* SALVAGE utility to restore deleted files.

  To salvage already-deleted files, restore them before upgrading.

- ❏ Make at least two backups of your NetWare 3.*x* or NetWare 4.*x* system. Do not attempt an upgrade without a backup.

- ❏ Notify users to log out of the NetWare 3.*x* or NetWare 4.*x* server.

  Broadcast a message from the console that users must log out before the server upgrade. Users must stay logged out until the upgrade is complete.

❑ If you are using third-party NLMs, disk drivers (*.DSK), or LAN drivers (*.LAN), check with your Novell Authorized Reseller℠ representative for compatibility issues before upgrading your network.

Or, call 1-800-414-LABS to receive a FAXBACK catalog listing drivers and modules that are compatible with NetWare 4.11. Call 1-801-861-5544 for operator assistance.

Most third-party disk and LAN drivers written for NetWare 3.11 and 3.12 work with NetWare 4.11.

❑ If you are upgrading a NetWare 3.1*x* server into an existing Directory tree, gather the following information:

- Tree name
- Which context to place this server into
- Administrator's name (user ADMIN or another user with Supervisor object rights to this context)
- Administrator's password (for authentication to the Directory)

❑ If you are upgrading several servers into the same NetWare Directory Services context, do this before upgrading:

- Consolidate names of users who exist under different names on different servers. For example, user Mark Peters might be MARK on server ONE and MPETERS on server TWO. If you upgraded both servers into the same context, two User objects would be created for the same user, Mark Peters.
- Change names of users with the same names on different servers that are upgraded into the same context. For example, there might be a user MARK on server ONE and a different user MARK on server TWO. Even though they are two different users, you could accidentally merge them into one Directory object called MARK. (You can rename conflicting bindery object names during the upgrade process.) For example, a merge of user MARK on server ONE and MARK on server TWO gives server ONE's MARK access to both servers' files.

Copy the New Boot Files

Procedure

1. **From the server's volume SYS:, copy the LAN drivers (.LAN files) used by your server and your server's AUTOEXEC.NCF file to a floppy diskette.**

   Take this precautionary measure to ensure you have a backup of these files.

2. **Bring down the server.**

   At the system console (:), type

   `DOWN` <Enter>

3. **Exit to DOS by typing**

   `EXIT` <Enter>

4. **Change to the server boot directory and, on the floppy diskette you used in Step 1, copy the following files:**

   *.BAT (batch files)
   *.NAM (name spaces)
   The device drivers (such as IDE.DSK) used by your server
   INSTALL.NLM
   SERVER.EXE
   STARTUP.NCF
   VREPAIR.NLM

5. **(Optional) If you are upgrading a NetWare 3.1*x* server, use the DOS RENDIR command to rename your SERVER.31*x* directory to NWSERVER.**

   This allows you to copy the NetWare 4.11 server boot files to the existing boot directory and thus save disk space on your DOS partition.

6. **Change to the drive letter corresponding to your CD-ROM drive, or to the mapped drive where the NetWare 4.11 *Operating System* files are located and type**

   `INSTALL` <Enter>

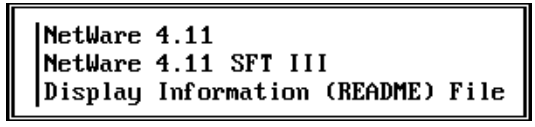
   If you are using a multiple language NetWare 4.11 *Operating System* CD-ROM, the following menu appears.

Figure 2-1
Choose the Desired Server Language

7. **(Conditional) If you are installing from a multiple language CD-ROM, choose the language in which you want the server upgraded and press** <Enter>**.**

8. **Choose "NetWare Server Installation" and press** <Enter>**.**

   The following menu appears.

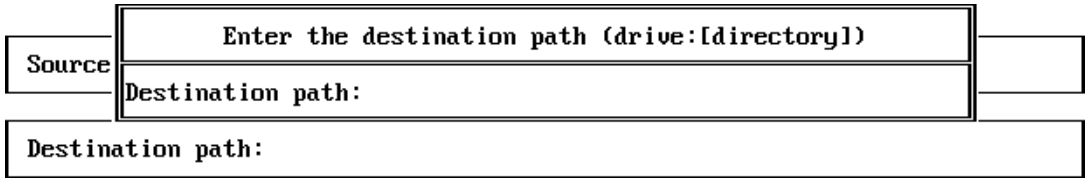


9. **Choose "NetWare 4.11" and press** <Enter>**.**

10. **Choose "Upgrade NetWare 3.1*x* or 4.*x*" and press** <Enter>**.**

The following screen appears.

Figure 2-2
The Source and Destination Paths



11. **Specify the destination path where you want the boot files copied and press** <Enter>**.**

    For example

    C:\NWSERVER

12. **(Conditional) If you typed a new destination directory (that does not exist), choose "Yes" and press** <Enter> **to create the new directory.**

13. **(Conditional) If you did not rename your boot directory in Step 5, press** <Enter> **to continue.**

    You are prompted to enter the path to your existing SERVER.EXE file.

14. **(Conditional) If you did not rename your boot directory in Step 5, type the path to your existing SERVER.EXE file and press** <Enter>**.**

    For example:

    C:\NWSERVER

Note

Recall that the SERVER.31*x* directory was changed to NWSERVER in Step 5.

The boot files are copied to the new destination directory.

Once the files have been copied, a screen may display drivers that were found in the existing startup directory, but were not updated.

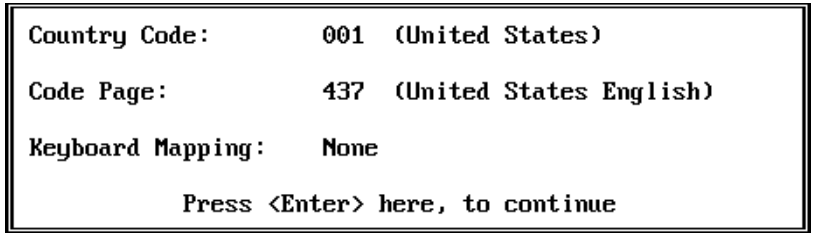
15. **Press** <Enter> **to continue.**

16. **Continue with "Specify Language."**

Specify Language

Once all boot files are copied, the "Language Configuration" screen appears.

Figure 2-3
Language Configuration Screen



Note

For information on any of the settings in this screen, press <F1> or refer to your DOS manual.

Procedure

Procedure

1. **Specify the country code, code page, and keyboard mapping.**

   Use the Up- and Down-arrow keys to maneuver through the screen.

   1a. **(Conditional) If the country code setting is *not* correct, press** <Enter> **to view options and choose an applicable country code.**

   The "Code Page" field is highlighted.

   1b. **(Conditional) If the code page setting is *not* correct, press** <Enter> **and choose an applicable code page.**

   The "Keyboard Mapping" field is highlighted.

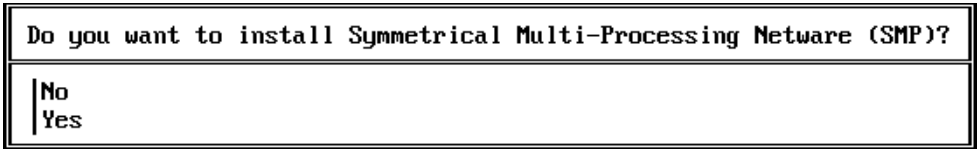
   1c. **(Conditional) If you do *not* have a standard U.S. English keyboard, press** <Enter> **and choose an applicable keyboard type.**

2. **Press** <Enter> to save and continue**.**

SERVER.EXE is then loaded.

If your server is a symmetrical multi-processor computer that does not have NetWare SMP installed on it, the following screen appears.

Figure 2-4
Specify If You Want to Install NetWare SMP



If	Then
The screen in Figure 2-4 appears and you want to install NetWare SMP	Go to “Install NetWare SMP (Conditional)” in *Installation*.
The screen in Figure 2-4 appears but you do not want to install NetWare SMP	Choose “No” and then go to “Load the Device Drivers.”
The screen in Figure 2-4 does not appear	Go to “Load the Device Drivers.”

Load the Device Drivers

Loading Device Drivers Automatically

INSTALL.NLM's driver autodetection functionality detects your server's hardware and may load the appropriate device drivers automatically without any user input.

Whether the correct device drivers can load depends on your server bus (supported buses include EISA, PCI, PNPISA, MCA, SCSI, and IDE), and if the driver's product ID is present in the DDI file.

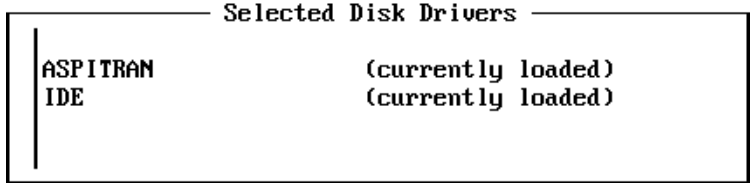
If the device drivers are loaded automatically, the screen in Figure 2-5 does not appear.

If	Go to
INSTALL.NLM loads the device drivers automatically	Step 3 on page 20.
INSTALL.NLM does not load the device drivers automatically	"Loading Device Drivers Manually."

Loading Device Drivers Manually

If the device drivers are not autodetected and loaded automatically, a screen similar to the one below appears, displaying the device drivers currently loaded on your server.

Figure 2-5
Loaded Device Drivers Are Displayed



With NetWare 4.11, you can use disk drivers (.DSK files) or replace those with the NetWare Peripheral Architecture™ (NWPA) counterparts.

NPA separates driver support into two components: a Host Adapter Module (.HAM file) and a Custom Device Module (.CDM file). The HAM is the component used to drive the host bus adapter hardware. The CDM is the component used to drive hardware devices attached to a host adapter bus.

There are certain scalability advantages to upgrading to HAMs and CDMs. For more information, see Appendix G, "Understanding Driver Architecture," in *Installation.*

Procedure

1. Load your device drivers.

If you want to	Then
Continue to load disk drivers (.DSK files) rather than .HAM and .CDM files	Choose "Continue Installation." Continue with Step 3 on page 20.
Load the new .HAM and .CDM files	Choose "Deselect a selected drive." Choose "Select an additional driver." Then choose the appropriate .HAM file (the corresponding .CDM loads automatically). Continue with Step 2.

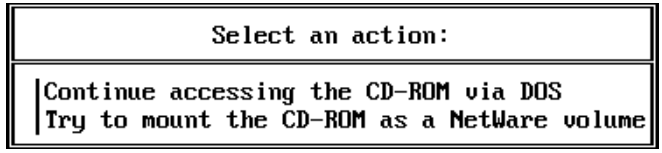
2. Verify that the displayed parameter settings are correct.

If you want to	Then
Accept the default values	Choose "Save Parameters and Continue."
Change the defaults because they do not match the installed hardware	Choose "Select/Modify Driver Parameters and Continue."

A prompt appears asking if you want to load any additional drivers.

If you want to	Then
Load additional device drivers	Choose “Yes” and press <Enter>. Then repeat Step 1 and Step 2.
Proceed without loading additional device drivers	Continue with Step 3.

The following screen may appear.



3. (Conditional) If the menu shown above appears, choose one of the menu options.

If a device driver in your STARTUP.NCF file conflicts with the DOS CD-ROM driver, your keyboard could lock up during the upgrade.

To avoid this, you can attempt to mount the CD-ROM as a NetWare volume. In doing so, you might be prompted to install new device drivers.

A message appears informing you that your server’s AUTOEXEC.NCF file will be scanned for LAN drivers without specified frame types. Any drivers with unspecified frame types will default to the 802.2 frame type.

If your server was using the 802.3 frame type (for example, NetWare 3.11), change the load command in the AUTOEXEC.NCF file after the upgrade.

4. Press <Enter> **to continue.**

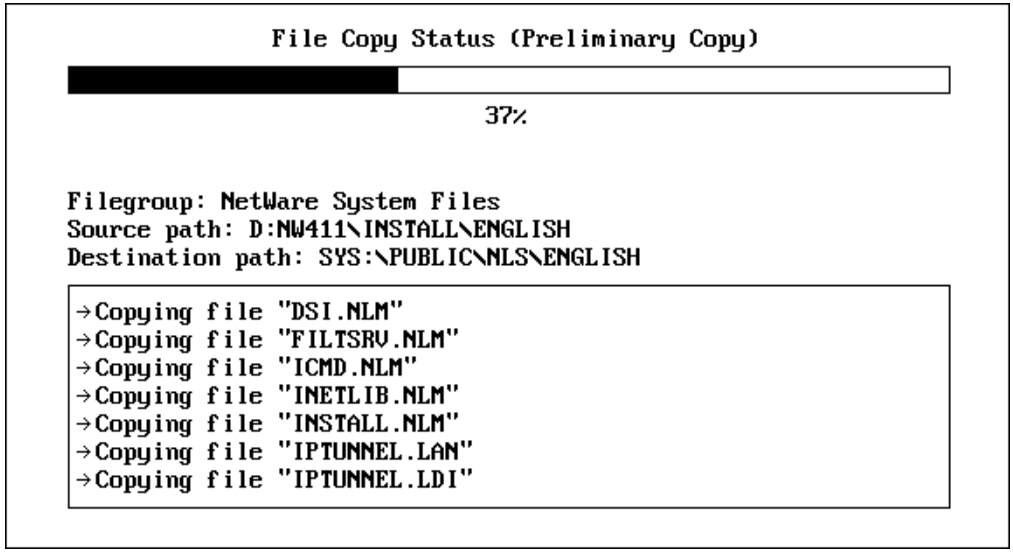
Driver and name space files are upgraded, available LAN drivers are scanned, and a portion of the NetWare 4.11 files are copied.

A message appears informing you that certain LAN drivers were replaced with their current updates. A list appears of those drivers that were not replaced.

5. Press <Enter> **to continue.**

At this time, NetWare copies only the SYSTEM and LOGIN files necessary to continue the upgrade. The remaining files are copied later in the upgrade.

Figure 2-6
The Files Needed to Continue Are Copied



You are prompted to insert the *License* diskette.

6. **Insert the *License* diskette and press** <Enter>**.**

7. **When prompted that the license installed successfully, press** <Enter>**.**

   A screen informs you that a temporary AUTOEXEC.NCF file will be executed.

   The temporary AUTOEXEC.NCF file is created from your existing AUTOEXEC.NCF file. Lines that could possibly cause a server abend (such as LOAD .NLM lines) are disabled with a REM command.

8. **View the temporary AUTOEXEC.NCF file.**

If	Then
Statements in your original AUTOEXEC.NCF file are required for your server to communicate on the network	Press <F3>. Remove any necessary REM commands. Press <F10> to continue.
You want to continue and execute the temporary AUTOEXEC.NCF file	Press <Enter> to continue.

9. Continue with "Load the LAN Drivers."

Load the LAN Drivers

Loading LAN Drivers Automatically

INSTALL.NLM's driver autodetection functionality detects your server's hardware and may load the appropriate LAN drivers automatically without any user input.

Whether the correct LAN drivers can load depends on your server bus (supported buses include EISA, PCI, PNPISA, MCA, SCSI, and IDE), and if the driver's product ID is present in the DDI file.

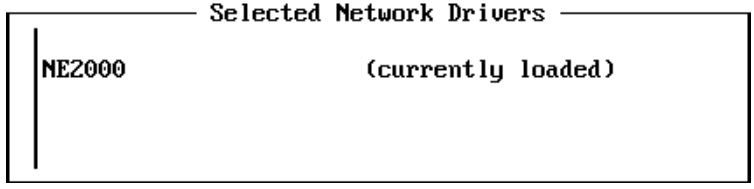
If the LAN drivers are loaded automatically, the screen in Figure 2-7 does not appear.

If	Go to
INSTALL.NLM loads the LAN drivers automatically	Step 2 on page 24.
INSTALL.NLM does not load the LAN drivers automatically	"Loading the LAN Drivers Manually."

Loading the LAN Drivers Manually

If the LAN drivers are not autodetected and loaded automatically, a screen similar to the one below appears, displaying the LAN drivers currently loaded on your server.

Figure 2-7
Loaded LAN Drivers Are Displayed



Procedure

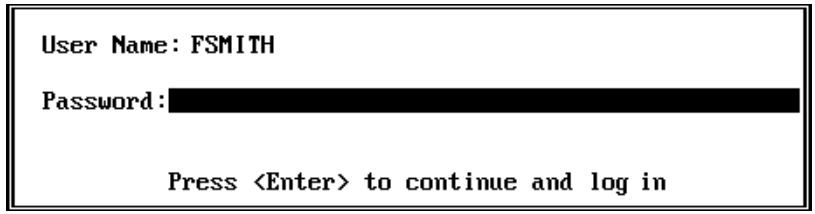
Procedure 2-3

1. Determine if you need to make any changes to the displayed LAN drivers.

If	Then
You need to load an additional driver	Choose “Load an additional driver” from the “Additional Driver Actions” menu. Choose the appropriate LAN driver. View the listed driver parameters and make any necessary changes. Choose “Save parameters and load driver” and press <Enter>.
You need to unload a selected driver	Choose “Unload a selected driver” from the “Additional Driver Actions” menu. Highlight the driver you want to unload and press <Enter> to unload it.
You want only the displayed drivers loaded	Press <Enter> to continue.

If you are installing from a remote network installation area, the following screen appears.

Figure 2-8
Enter Your Password to Reconnect to the Source Server



2. **(Conditional) Reenter your password to reconnect to the source server, and press** <Enter>**.**

   If you are installing from a remote network installation area, a client connection to the source server is disrupted once the LAN driver is loaded.

   The path to the source server is held in the client's memory, but you must reenter the password.

3. **Press** <Enter> **again.**

   If you are upgrading a NetWare 4 server, you are prompted to enter the Administrator password.

4. **(Conditional) Enter the Administrator password and press** <Enter>**.**

If you are upgrading a	Go to
NetWare 3.1*x* server	"Install NetWare Directory Services (Conditional)."
NetWare 4.*x* server	"Modify the AUTOEXEC.NCF File" on page 44.

Install NetWare Directory Services (Conditional)

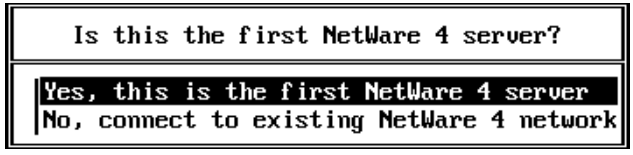
NetWare Directory Services (NDS) is a relational database that is distributed across your entire NetWare 4™ network. NDS provides global access to all network resources to which you have been given rights, regardless of where they are physically located.

Users log in to a multiserver network and view the entire network as a single information system called a Directory tree. The Directory tree's single view is the basis for increased productivity and reduced administrative costs.

The network is scanned for Directory trees. Unless you are upgrading the first NetWare 3.1*x* server in the network, you will most likely want to place the server into an existing Directory tree.

Based on your network configuration, one of the following screens appears.

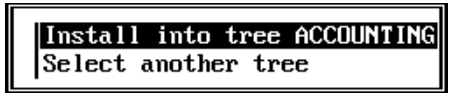
Figure 2-9
When No Directory Tree Is Located



If no NetWare 4 server (and associated Directory tree) can be located on the network, the menu shown above appears.

If	Go to
The menu in Figure 2-9 appears	"A Nonlocatable Directory Tree, or the First 3.1x Server Upgrade" on page 27.

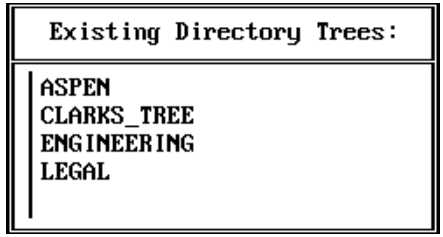
Figure 2-10
When a Single Directory Tree Is Located



If a single Directory tree is located, the Directory tree name is displayed as in the menu above.

If	Go to
The menu in Figure 2-10 appears	“A Single Directory Tree Is Found” on page 36.

Figure 2-11
When Multiple Directory Trees Are Located



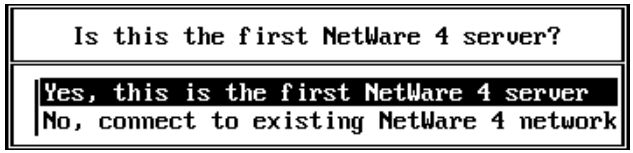
If multiple Directory Trees are located, a menu similar to the one shown above appears.

If	Go to
The menu in Figure 2-11 appears	“Multiple Directory Trees Are Found” on page 39.

A Nonlocatable Directory Tree, or the First 3.1*x* Server Upgrade

The menu below appears if there is no previously installed NetWare 4 server, or if the server you are upgrading cannot see the previously installed NetWare 4 server(s).

Figure 2-12
When No Directory Tree Is Located



If the Server Cannot Locate a Previously Installed Directory Tree

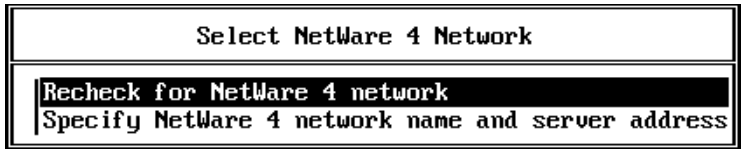
Procedure

Procedure

1. **From the "Is this the first NetWare 4 server?" menu, choose "No, connect to existing NetWare 4 network" and press** <Enter>**.**

   The following menu appears:

Figure 2-13
Select NetWare 4 Network Menu



Suggestion

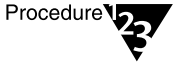
You can find out the network name by loading MONITOR.NLM on an existing server on the network. The network name is the same as the Directory tree name.

2. Choose one of the menu options.

If	Then
You have verified that an existing NetWare 4 server is up and physically connected to this server, and that both servers are bound to IPX™ with the proper LAN driver, frame type, and IPX external network number	Choose “Recheck for NetWare 4 Network” and press <Enter>. If a single Directory tree is located, go to “A Single Directory Tree Is Found” on page 36. If multiple Directory trees are located, go to “Multiple Directory Trees Are Found” on page 39.
Your network has SAP filtering and you know the IPX internal network number of an existing NetWare 4 server	Choose “Specify Address of NetWare 4 Server” and press <Enter>. Enter the name of the Directory tree and press <Enter>. Enter the IPX™ internal network number of an existing NetWare 4 server in the Directory tree and press <Enter>. If a single Directory tree is located, go to “A Single Directory Tree Is Found” on page 36. If multiple Directory trees are located, go to “Multiple Directory Trees Are Found” on page 39.

If This Is the First NetWare 3.1*x* Server Upgrade

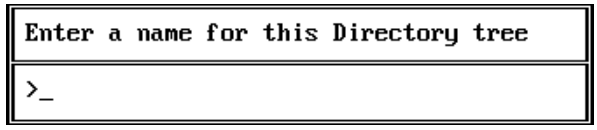
Procedure



1. Choose “Yes, this is the first NetWare 4 server” and press <Enter>.

The following screen appears, ready for you to name your new Directory tree.

Figure 2-14
Enter a Name for the Directory Tree



2. Specify the Directory tree name and press <Enter>**.**

Each Directory tree (hierarchy of the NetWare Directory database) must have a name that's unique across the internetwork. (Most organizations have only one Directory tree.) For more information on Directory trees, see *Guide to NetWare 4 Networks*.

Important

Each Directory tree has its own database of objects that is not visible from another tree. Be aware of this limitation before creating multiple Directory trees.

Once a Directory tree name has been entered, a list of time zones appears. (This list does not contain all existing time zones.)

3. Set up time synchronization.

For more information on time synchronization, see Chapter 5, "Planning the Time Synchronization Strategy" in *Guide to NetWare 4 Networks*, and "Time synchronization" in *Concepts*.

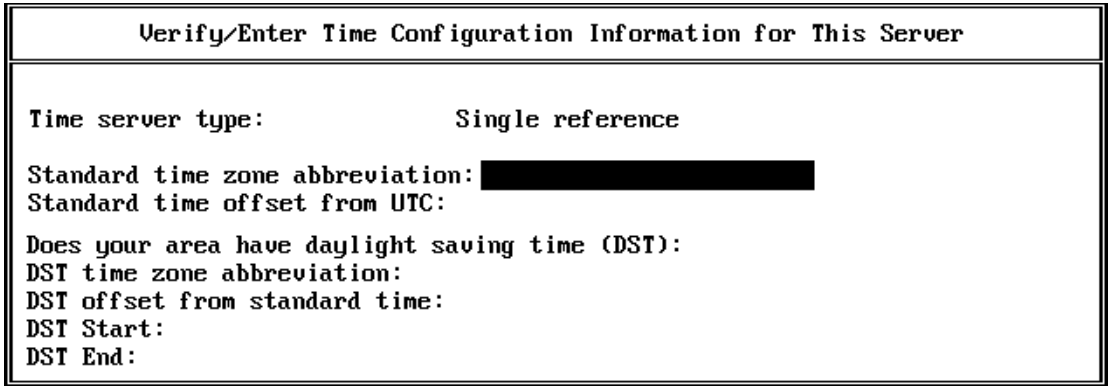
3a. Choose the time zone where this server exists.

If the time zone	Then
Is listed	Move the cursor to the appropriate time zone and press <Enter>. Verify that the information presented is correct. If it is, press <F10> and skip to Step 4. If it isn't, follow Step 3b through Step 3k to enter correct information.
Is not listed	Press <Ins> and continue with Step 3b.

3b. At the "Time Configuration Parameters" screen, verify or specify time synchronization parameters.

The following screen appears. The cursor appears in the "Standard Time Zone Abbreviation" field.

Figure 2-15
Time Configuration Screen



3c. (Conditional) If you want to choose a different time server type, highlight the "Time Server Type" field and press <Enter>**.**

There are four time server types:

- Single Reference
- Reference
- Primary
- Secondary

The default sets the first server in the Directory tree as a Single Reference server. All other servers default as Secondary servers.

Important

Do not change the time server defaults without a clear understanding of time server types. Press <F1> for help, or refer to Chapter 5, "Planning the Time Synchronization Strategy" in *Guide to NetWare 4 Networks*, for a description of these time server types.

3d. In the "Standard Time Zone Abbreviation" field, enter the three-letter abbreviation for your standard time zone and press <Enter>**.**

Not all time zones have agreed-upon abbreviations. Time zone information is subject to local custom and national rules. Find out what the commonly used abbreviation for your standard time zone is, or enter your own abbreviation.

The time information you specify is saved in this server's AUTOEXEC.NCF file. You can change it later by editing this file (see "Modify the AUTOEXEC.NCF File" on page 44.)

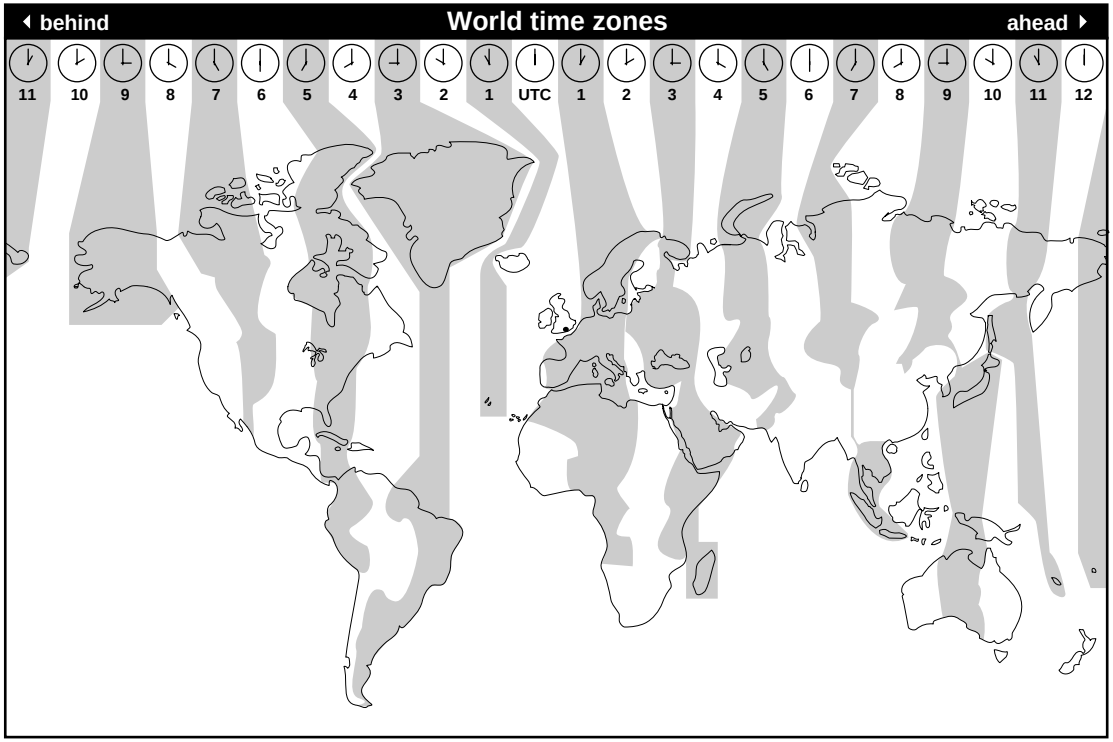
3e. In the "Standard Time Offset from UTC" field, enter the offset (in hours) from UTC (Universal Coordinated Time, formerly known as Greenwich Mean Time) and press <Enter>**.**

If your time zone is east of UTC, use "AHEAD" with the number, since your time is ahead of UTC. For example, in Germany you would type "1" and then press <Enter> to toggle to "AHEAD."

If your time zone is west of UTC, toggle to "BEHIND" because your time zone is behind UTC.

Use the following illustration to find your time zone's offset from UTC.

Figure 2-16
World Time Zones and Their Offsets from UTC



3f. In the "Does Your Area Have Daylight Saving Time (DST)" field, press <Enter> **and use the arrow keys to toggle between "Yes" and "No."**

If	Then choose	And then
Your time zone switches to daylight saving time (and back to standard time) during each year	Yes	Continue with Step 3g.
Your time zone never switches to daylight saving time	No	Continue with Step 3k.

3g. In the "DST Time Zone Abbreviation" field, enter the three-letter abbreviation your time zone uses during daylight saving time and press <Enter>**.**

Important

If you do not specify the abbreviation for daylight saving time, the server won't automatically adjust for the seasonal change. Internal algorithms assume that if no DST abbreviation is specified, local custom is to not observe DST.

3h. In the "DST Offset from Standard Time" field, enter the difference between standard time and daylight saving time and press <Enter>**.**

Enter the offset in hours:minutes:seconds. The default is 1:00:00 (one hour) *ahead*, meaning that your daylight saving time is one hour ahead of your standard time.

If daylight saving time in your area varies from your standard time by more or less than the default (one hour), enter a different time offset.

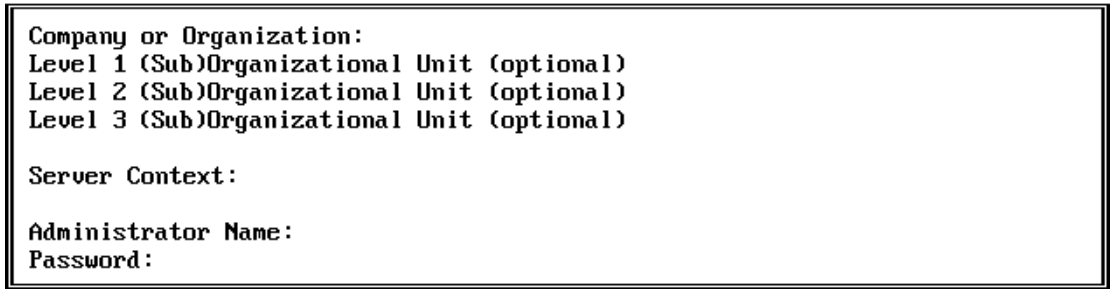
3i. In the "DST Start" field, specify the starting day for daylight saving time and press <Enter>**.**

3j. In the "DST End" field, specify the day daylight saving time ends and press <Enter>**.**

3k. Save the time configuration information by pressing <F10> **and then** <Enter>**.**

The following screen appears, prompting you to specify the server's NDS context.

Figure 2-17
Server Context Screen



4. Specify the server's context.

The server context, or name context, specifies where the server is located in the hierarchical Directory tree. The context is composed of

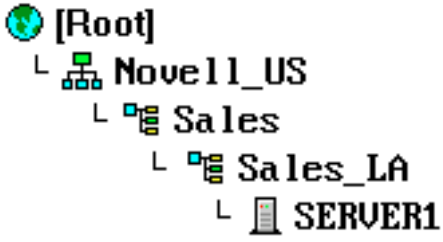
- A company or organization name (example: O=Novell).
- Optional names of organizational units and subunits, such as divisions or departments (example: OU=Sales).
- An optional country code (example: C=US).

Note

For recommendations on how to lay out your Directory tree, see Chapter 3, "Designing the Directory Tree Structure" in *Guide to NetWare 4 Networks*.

For example, if your NetWare server were located in the "Sales_LA" group of the Sales department of a company called "Novell_US," the server's context would look like this:

Figure 2-18
Example of a Context



OU=Sales_LA.OU=Sales.O=Novell_US

Note

The object "[Root]" is automatically created during NDS installation.

For more information on context and naming conventions, see *Guide to NetWare 4 Networks*.

4a. In the "Company or Organization" field, type your company or organization name and press <Enter>.

Only valid characters (letters a through z, numbers 0 through 9, hyphen, underscore) can be used.

4b. (Optional) In the "Level 1 (Sub)Organizational Unit" field, type in an Organizational Unit name (such as a division or a department) and press <Enter>**.**

4c. (Optional) in the "Level 2 (Sub)Organizational Unit" field, type in an additional Organizational Unit name and press <Enter>**.**

4d. (Optional) In the "Level 3 (Sub)Organizational Unit" field, type in an additional Organizational Unit name and press <Enter>**.**

You can manually enter more than three levels of Organizational Units (up to 25) into the "Server Context" field. Make sure you enter a period (.) as a delimiter between each new entry.

Entries in the "Server Context" field must be in a typeless naming format. For example, the context in Figure 2-18 would be .SALES_LA.SALES.NOVELL_US

4e. (Optional) Return to the "Server Context" field and type a country code or additional Organizational Units and press <Enter>**.**

Enter the country code after the company name, separated by a period. For example, if your country is France, add ".C=FR" to the end of the server context.

Although a country code is not required, it can be useful in a multinational organization.

For a list of country codes, see Appendix C, "Country Codes," in *Installation*.

Adding a country code to the context may create some problems with default naming in some NetWare 4.11 utilities, because the utilities assume the highest level to be O=*organization*.

That means that if you use Country in the Directory tree, you always have to include name typing (CN=.OU=.O) whenever you log in or refer to an object name in the tree, regardless of what context you or the other object are in.

For example, if you included the country code for the United States (US), the object name for Dave Smith might be

CN=DSSMITH.OU=ACCOUNTING.O=NOVELL.C=US

For more information, see Chapter 3, "Designing the Directory Tree Structure" in *Guide to NetWare 4 Networks*.

If you want to establish more than three Organizational Unit levels, you can do so while in the "Server Context" field. For example, if you wanted to create a fourth Organizational

Unit level in Figure 2-18 on page 34, you would type OU=*organizational unit name* on the left end of the context.

5. **Note the administrator's name.**

   The default common name (CN) for the administrator of the first NetWare 4.11 server in a Directory tree is ADMIN. User ADMIN is created directly under the Organization (O=) level.

6. **Type the administrator's password and press** <Enter>**.**

7. **At the prompt, retype the password and press** <Enter>**.**

Important

This password is also the password for the bindery user SUPERVISOR. If you change the administrator password later (using the NetWare Administrator or NETADMIN utilities), the SUPERVISOR password does *not* change until you change it using the SYSCON utility.

8. **Press** <F10> **to save the Directory information.**

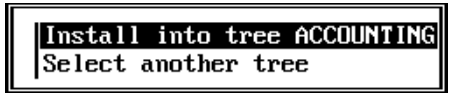
   A message appears indicating that NetWare Directory Services is being installed.

9. **Continue with "Modify the AUTOEXEC.NCF File" on page 44.**

A Single Directory Tree Is Found

If, after scanning the network, a single Directory tree is found, the tree name is displayed along with the following menu.

Figure 2-19
When a Single Directory Tree Is Found



Procedure

Procedure

1. **Choose an option from the menu.**

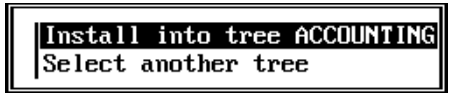
If	Then
You want to install into the displayed Directory tree	Go to "Install into the Displayed Directory Tree" on page 37.

If	Then
You want to install into a Directory tree that is not displayed	Go to “If the Server Cannot Locate a Previously Installed Directory Tree” on page 27.
You want to create a new Directory tree	Choose “Select Another Tree” and press <Enter>. Press <Ins>. At the confirmation prompt, press <Enter>. Follow the procedures under “If This Is the First NetWare 3.1x Server Upgrade” on page 28.

Install into the Displayed Directory Tree

Install the new NetWare 4.11 server into the Directory tree displayed in the menu below by completing the procedures that follow.

Figure 2-20
When a Single Directory Tree Is Found



Important

Depending on its structure, the displayed Directory tree can be either a “simple” tree (a single-level tree installed using the “Simple Installation” option) or a “custom” tree (a multilevel tree installed using the “Custom Installation” option).

Procedure

Procedure

1. **Choose “Install into Tree** *tree name*”** and press** <Enter>**.**

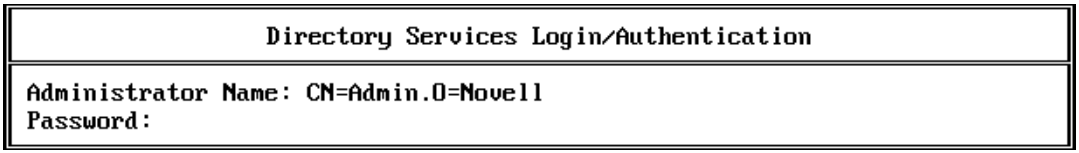
   A list of time zones appears.

2. **Set up time synchronization by completing Step 3 on page 29.**

   After setting up time synchronization, one of the following screens appears:

Figure 2-21
When a Simple Directory Tree Is Found

Figure 2-22
When a Custom Directory Tree Is Found

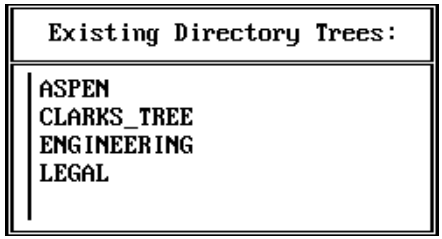


If	Then
The screen in Figure 2-21 appears	Type the administrator password and press <Enter>. Continue with “Modify the AUTOEXEC.NCF File” on page 44.
The screen in Figure 2-22 appears	If necessary, type the administrator name and press <Enter>. Type the administrator password and press <Enter>. Complete Step 4 on page 34 to set up the server’s context. Then continue with “Modify the AUTOEXEC.NCF File” on page 44.
The screen in Figure 2-21 appears and you want to customize (add additional levels to) the Directory tree	Press <F4>. If necessary, type the administrator name and press <Enter>. Type the administrator password and press <Enter>. Complete Step 4 on page 34 to set up the server’s context. Then continue with “Modify the AUTOEXEC.NCF File” on page 44.

Multiple Directory Trees Are Found

If multiple Directory trees are found, the “Existing Directory Trees” menu appears.

Figure 2-23
When Multiple Directory Trees Are Found



Procedure

Procedure

1. Choose the Directory tree you want this server to be part of.

A list appears of all Directory trees that are visible from this server.

Important

Make sure you choose the correct Directory tree name. If your organization has more than one tree, attaching to the wrong tree or creating a new Directory tree prevents this server from sharing data within the desired Directory database.

Choosing an existing tree makes this server part of that tree’s NetWare Directory database.

1a. (Conditional) If the Directory tree you want this server to be part of is not displayed, verify that an existing NetWare 4 server in that tree is up and physically connected to this server, and that both servers are bound to IPX with the proper LAN driver, frame type, and IPX external network number. Then press <F4> **to rebuild the list.**

1b. (Conditional) If your network has SAP filtering and you know the IPX internal network number of an existing NetWare 4 server, press <F3> **and enter the name of the Directory tree and press** <Enter>**. Then, enter the IPX internal network number of an existing NetWare 4 server in the Directory tree and press** <Enter>**.**

1c. (Conditional) If you need to create a new Directory tree on the network, press <Ins>**. At the confirmation prompt,**

press <Enter>**. Follow the procedures under "If This Is the First NetWare 3.1x Server Upgrade" on page 28.**

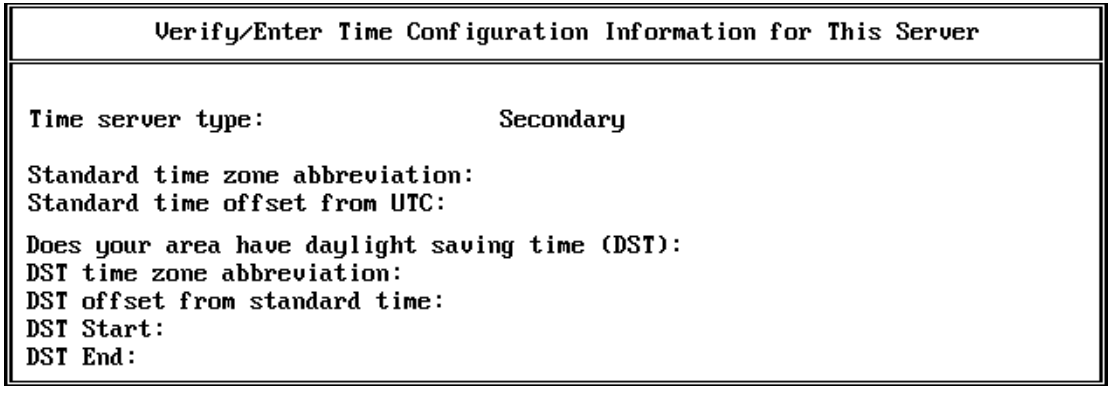
2. Specify time synchronization parameters.

2a. Choose the time zone you want to upgrade this server in.

If	Then
Your time zone is listed	Move the cursor to your time zone and press <Enter>. Verify that the information presented is correct. If it is, press <F10> and continue with Step 3. If it isn't, enter the correct information by proceeding with Step 3b under "If This Is the First NetWare 3.1x Server Upgrade" on page 28.
Your time zone is not listed	Press <Ins> and proceed with Step 3b under "If This Is the First NetWare 3.1x Server Upgrade" on page 28.

The time configuration defaults for all servers except the first NetWare 4 server appear.

Figure 2-24
Time Configuration Screen



2b. (Conditional) If you chose a simple Directory tree, the following screen appears.

Figure 2-25
If You Chose a Simple Directory Tree

Note

A “simple” Directory tree is a single-level tree that was installed using the “Simple Installation” option.

If	Then
You want to place this server into the simple Directory tree	Type the administrator password and press <Enter>. Continue with “Modify the AUTOEXEC.NCF File” on page 44.
You want to customize the simple Directory tree (create multiple levels)	Press <F4>. If necessary, type the administrator name and password and press <Enter>. Type the administrator password and press <Enter>. Complete Step 4 on page 34. Continue with “Modify the AUTOEXEC.NCF File” on page 44.

2c. In the “Verify/Enter Time Configuration Information for this Server” screen, verify or specify time synchronization parameters.

Refer to Chapter 5, “Planning the Time Synchronization Strategy” in *Guide to NetWare 4 Networks* for information on how to plan for time synchronization.

Then see “A Nonlocatable Directory Tree, or the First 3.1x Server Upgrade” on page 27 for instructions on how to configure time parameters.

2d. Press <F10> **to save and continue.**

A prompt appears asking for the administrator login name and password.

3. **(Conditional) If the administrator's name is not displayed, type the complete name for the administrator and press** <Enter>**.**

   For example, type

   CN=ADMIN.O=NOVELL

   Or, if you specified a country, type

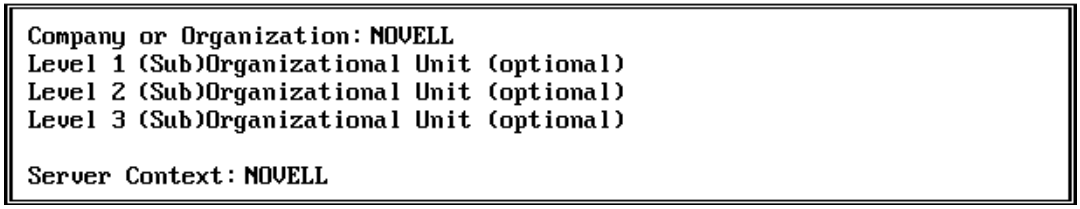
   CN=ADMIN.O=NOVELL.C=US

   When the first NetWare 4 server is installed, the administrator's default name is ADMIN, but this name could have been changed after the first NetWare 4 server was installed.

4. **Type the administrator's password and press** <Enter>**.**

5. **In the screen shown below, choose an existing NetWare 4 context or specify a new one.**

Figure 2-26
Specify the Server Context



If you want to	Then
Place this server into a previously defined context	Press <Enter> at each organizational level to view existing container objects and choose the object you need.
Define a new context for this server	Enter one or more new Organizations (O=) and/or Organizational Units (OU=). See below for examples.

You can either place this server into a previously defined context or you can specify a new context. By defining a context that doesn't exist yet, you create the context—that is, you create a new branch in the Directory tree.

Assume the context of the only existing NetWare 4 server is

OU=NEW_PRODUCTS.OU=MARKETING.O=NOVELL

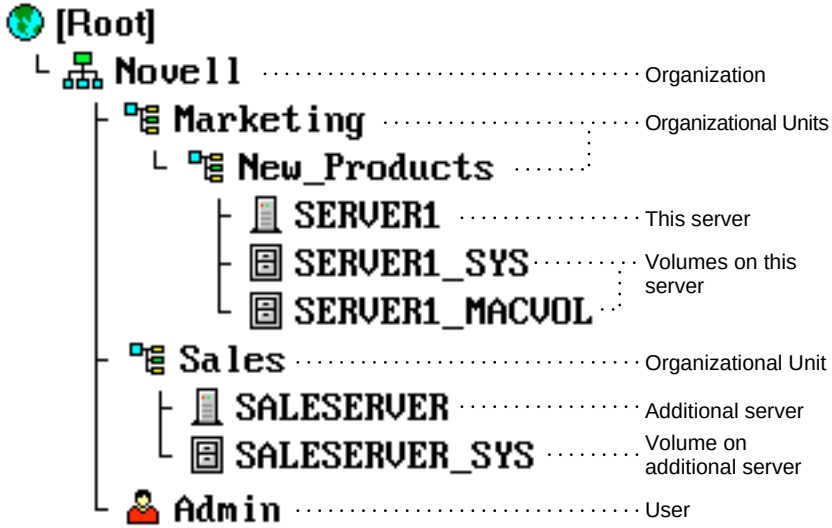
If you specify the new server's context as

OU=SALES.O=NOVELL

the Directory tree will have a new "branch" (Sales). After server upgrade, you can view your Directory tree using the NETADMIN or NetWare Administrator utility.

The following illustration shows an expanded tree:

Figure 2-27
Expanded Directory Tree Example



Important

By default, INSTALL.NLM adds a replica of the partition that contains the server's context only if the number of existing replicas is less than three.

However, if the server is not a NetWare 4 server and contains bindery files (SYS:SYSTEM\NET$.SYS), a replica is added regardless of the number of replicas.

In the example above, the master replica of the partition "OU=SALES" resides on server SALESSERVER. Its read-write replica resides on

server SERVER1. You can modify partitions with PARTMGR NetWare Administrator, after server and workstation installations are complete.

For more information on Directory partitions, see Chapter 4, “Determining a Partition and Replication Strategy” in *Guide to NetWare 4 Networks*.

6. **To save Directory information, press** <F10>**.**

   A confirmation menu appears.

7. **Press** <Enter> **to choose “Yes.”**

8. **Continue with “Modify the AUTOEXEC.NCF File.”**

Modify the AUTOEXEC.NCF File

INSTALL.NLM scans the server’s AUTOEXEC.NCF file to verify that Ethernet 802.2 frame support is loaded for Ethernet LAN drivers.

NetWare versions earlier than NetWare 3.12 used the Ethernet 802.3 frame type. Your upgraded server by default loads the 802.2 frame type. The new frame type, along with the new NDS information, is displayed in a new AUTOEXEC.NCF file.

Procedure

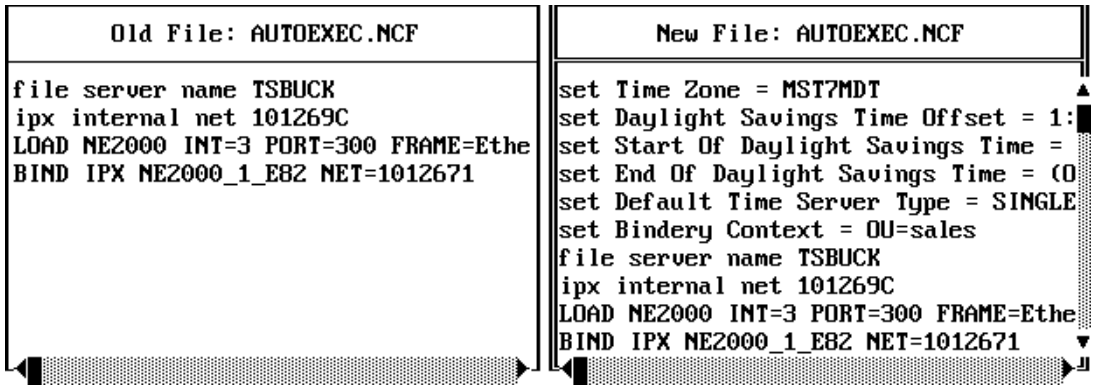
1. **Read the prompt explaining the changes in the AUTOEXEC.NCF file and press** <Enter>**.**

   A new prompt appears, listing other changes that may be added to the AUTOEXEC.NCF file.

2. **Read the prompt and press** <Enter>**.**

   A screen similar to the one below appears.

Figure 2-28
The Old and New AUTOEXEC.NCF Files Are Displayed



The old AUTOEXEC.NCF file is displayed on the left, the new one is displayed on the right.

Use the scroll bars to view the portions of the lines that are out of view.

3. **Make any desired modifications to the new AUTOEXEC.NCF file using the keys indicated on the screen.**

Important

If you are upgrading a NetWare 3.11 server, or if your server's old AUTOEXEC.NCF file had a command to load the 802.3 frame type, a LOAD command for both the Ethernet 802.2 and 802.3 frame types are placed in the new AUTOEXEC.NCF file. To reduce network traffic, load only one frame type, preferably the 802.2.

4. **Press** <F10> **to continue.**

A prompt appears asking if you want to save the new AUTOEXEC.NCF file.

5. **Choose "Yes" and press** <Enter> **to save the new AUTOEXEC.NCF file.**

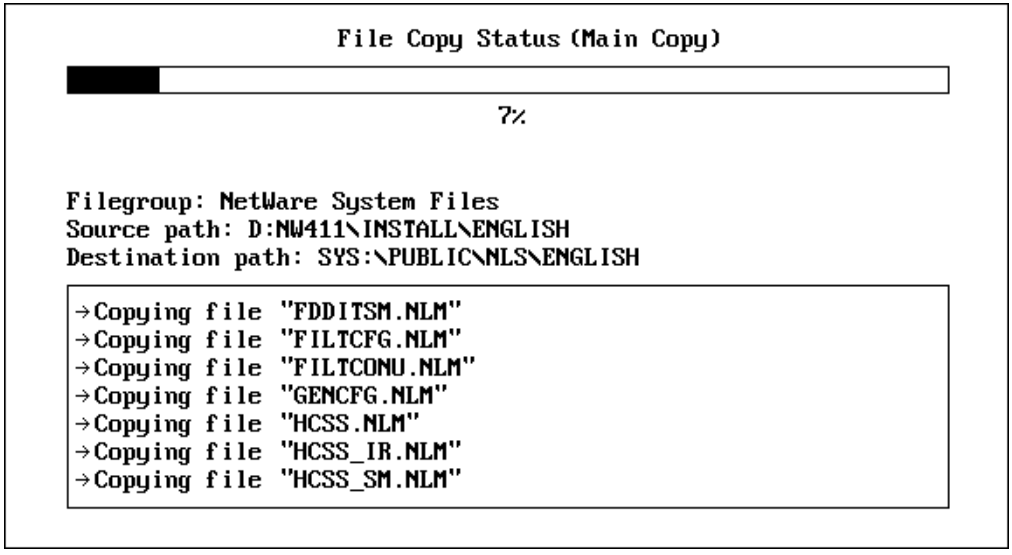
The remaining NetWare files are copied to the server. This could take several minutes.

Note

After these files are copied, the server upgrade is essentially complete. If you want, you can install additional items or products. For a discussion of each item or product, see Chapter 3, “Perform Other Installation Options (Optional)” in *Installation*.

Figure 2-29

The Remaining NetWare Files Are Copied to the Server



Once the remaining NetWare files have been copied, the upgrade is complete. A menu of optional installable products and items are displayed.

6. **(Conditional) If you want to perform any of the installation options, continue with Chapter 3, “Perform Other Installation Options (Optional)” in *Installation*.**

What to Do after the Upgrade

Once your servers are upgraded, you should take the time to perform any applicable network upgrade tasks. These include

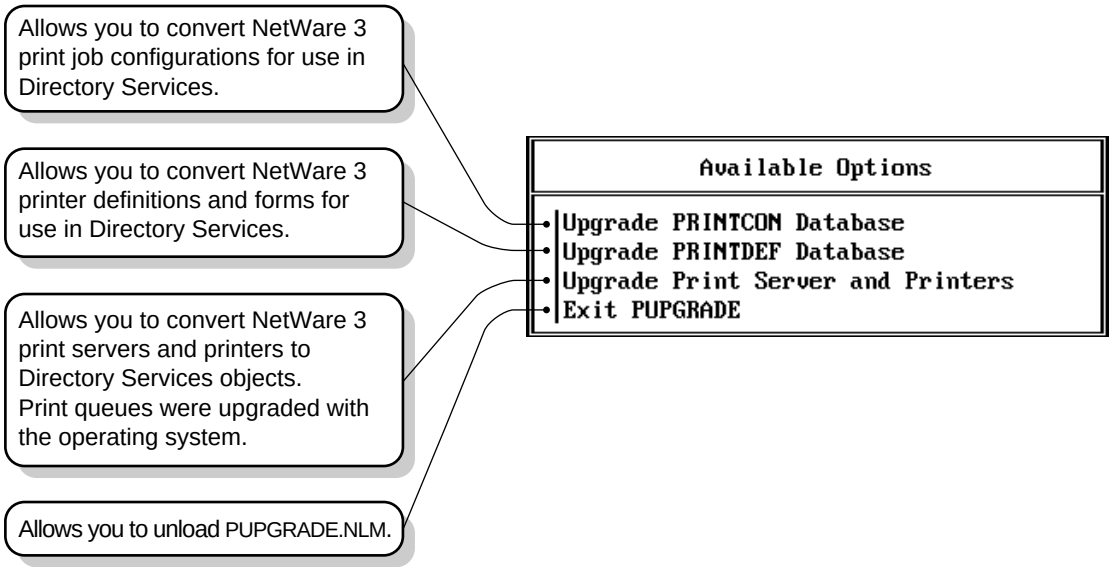
- Upgrading your printing configuration
- Modifying login scripts
- Copying NetWare 4.11 utilities to other servers (conditional)
- Other administrative tasks

Upgrading Your Printing Configuration

Upgrade your NetWare 3 print servers and queues to NetWare 4 NDS objects, as well as PRINTCON and PRINTDEF databases to the NetWare 4 format using the PUPGRADE.NLM.

The following figure shows the tasks you can perform with PUPGRADE.NLM.

Figure 2-30
PUPGRADE Tasks



Upgrading NetWare 3 Printing Objects with PUPGRADE.NLM

Use the following procedures to upgrade bindery print servers, printers, print job configurations, or print device definitions.

Procedure

1. **At the system console, type**

   LOAD PUPGRADE <Enter>

PUPGRADE.NLM can also be launched by loading INSTALL.NLM, selecting “Product Options,” and then selecting “Upgrade 3.1x Print Services.”

2. **Type in your username at the prompt.**

   You must be user ADMIN or equivalent. For example, you might type

   .ADMIN.NOVELL

   You are also prompted for a password.

3. **Enter your password and press** <Enter>**.**

   The “Available Options” menu appears.

4. **Select the option you want.**

   Each option is discussed in the following paragraphs.

Upgrading the PRINTCON Database

When you select “Upgrade PRINTCON Database,” a log appears that shows the elements of the database as they are upgraded. No action is required.

When the upgrade process is complete, the log is stored in ASCII format as file SYS:SYSTEM/PRINTCON.UPG. Here you can read the upgrade information and review any errors that may have occurred.

Upgrading the PRINTDEF Database

When you select "Upgrade PRINTDEF Database," an "Enter Context" window appears with the container object listed (example: "O=Novell"). Select the context shown or type the context you want to use. Then press <Enter>.

A log appears that shows the forms, device definitions, functions, and modes that are being upgraded. No action is required.

When the upgrade process is complete, the log is stored in ASCII format as file SYS:SYSTEM / PRINTDEF.UPG. Here you can read the upgrade information and review any errors that may have occurred.

Upgrading a Print Server and Associated Printers

When you select "Upgrade Print Server and Printers," a list of the existing NetWare 3 print servers appears. Select the server you want to upgrade.

Only print servers that existed before the NetWare server was upgraded appear on this list. After you have upgraded your NetWare 3 server, you cannot add any bindery objects that PUPGRADE recognizes. If you add a bindery print server after the NetWare server is upgraded, the print server has no Directory Services object ID assigned to it. PUPGRADE finds only the old bindery ID, not the Directory Services object ID it is looking for.

A log appears that shows the print server being upgraded, printers that are being upgraded, notification objects, print queues, and so forth. No action is required.

User SUPERVISOR is not carried over to the NetWare 4 environment.

Also, because user ADMIN does not exist in NetWare 3, user ADMIN is not included in the list of authorized users for upgraded print queues. In addition, user ADMIN is not included as an authorized operator for upgraded print queues and print servers. You must manually add user ADMIN to these lists before it is authorized.

When the upgrade process is complete, the log is stored in ASCII format as file SYS:SYSTEM / <*printserver*>.UPG. Here you can read the upgrade information and review any errors that might have occurred. Each print server has its own upgrade log file.

Modifying Login Scripts

You must make any necessary modifications to the container login script (which replaces the NetWare 3 system login script) and user login scripts.

If you changed the server name, update references to the server in the container and user login scripts.

Although user login scripts are upgraded, they are not modified and server names are not changed to match your new environment. Use the NetWare Administrator utility to modify the login scripts.

If you have set up your login scripts so that users have drive mappings to directories in which they have no rights, these users receive the following message when they log in:

```
Attempt to map drive to invalid path in MAP command.
```

Complete one of the following:

- Delete the drive mapping from the login script.
- Delete the drive mapping from the system login script and insert the drive mapping in the user's login script only when the user has been granted rights to the directory.
- Create a group, grant the group the trustee assignment, assign the appropriate users to the group, and then use an IF…THEN command in the system login script before the drive mapping (IF member of "*groupname*," THEN map *drive*:=*volume:directory*).

Certain login script commands have to be modified or deleted after the upgrade:

- MEMBER_OF_*group*

  Groups have been replaced by Group objects and Profile objects. This variable becomes a Group object in NetWare 4. For more information, see Chapter 3, "Creating Login Scripts" in *Supervising the Network*.

- MAP command

When you map a drive to a directory that's located on a NetWare 4 NDS volume, modify the volume name to correspond to the new Directory name.

However, when you map a drive to a server that is running a previous version of NetWare, the MAP command functions as it did originally and must include the servername.

- ATTACH command

  Users can still attach to pre-4.11 servers, but the ATTACH command is not valid for NetWare 4.11 servers.

The majority of login commands work the same under NetWare 4.11 as they did under previous NetWare versions. In MAP commands, if the server is not specified (MAP F:=SYS:directory), the Message Server attribute of the User is used.

Copying NetWare 4.11 Utilities to Other Servers (Conditional)

If you are going to maintain a mixed NetWare 3 and NetWare 4 environment, copy some NetWare 4.11 utilities to the PUBLIC directories of the 3.*x* servers.

You can copy these utilities easily using the NetSync utility. NetSync also unifies the individual 3.*x* server binderies. If you do not want the binderies unified, copy the files manually.

For a list of the files, refer to the INSTALL.DAT file located in the SYSTEM\NETSYNC subdirectory.

If you decide to copy the files manually, do not copy the listed print files. The print files are needed only for binderies unified through NetSync.

Other Administrative Tasks

You should review the post-upgrade suggestions below.

- Check applications to see if they run properly.

  Some DOS applications don't work when installed on volumes that have more than 32 MB of disk space. Some of these applications can be made to work by doing the following:

  - Restrict the application's directory on the destination server with DSPACE.
  - Make the directory path a fake root using the MAP command.

- Check directory security.
- Set new directory and file attributes using FLAG or FILER.
- If you have workstations that boot from diskettes, create new boot diskettes for each workstation.
- If the server was renamed, change the server's name in the users' AUTOEXEC.BAT files to the new NetWare 4.11 server name.
- Check user restrictions and accounting charge rates to make sure your system is configured the way you want it.
- (Optional) To store Macintosh* files and folders on a NetWare 4.11 server, install NetWare for Macintosh on the NetWare 4.11 server.

  This product provides support for Macintosh workstations that connect to the NetWare 4.11 server.

- Assign Directory object and property rights to Directory objects that were upgraded from bindery objects.

  See Chapter 1, "Managing NetWare Directory Services Objects," of *Supervising the Network* for details.

- To set up the maximum amount of disk space a user can use, use the NETADMIN or NetWare Administrator utility in NetWare 4.11 after you have finished the upgrade to NetWare 4.11.

- Allow users to log in to the NetWare 4.11 server.

  Users can log in if

  - Volume SYS: is mounted
  - The user exists in the bindery
  - The LAN driver is loaded and bound to a protocol
  - Logins are enabled

  To ensure that logins are enabled, type

  ENABLE LOGIN <Enter>

chapter 3

Upgrade Across-the-Wire Using the DS Migrate Utility

Overview

This option allows you to upgrade your NetWare® 2.1*x*, 2.2, or 3.1*x* bindery server by migrating modeled bindery information to an existing NetWare 4™ Directory tree. Bindery migration is done through the new DS Migrate utility.

DS Migrate is a migration and modeling solution provided from a partnered agreement between Preferred Systems Inc., the makers of DS Standard* (the utility on which DS Migrate is based) and Novell, Inc.

Following the migration of the server bindery, the server files are migrated using the new NetWare File Migration utility (for NetWare 3.1*x* servers) or MIGRATE.EXE (for NetWare 2.1*x* or 2.2 servers).

Both DS Migrate and the NetWare File Migration utility are launched through the “Tools” menu of NetWare Administrator.

This method is the recommended way of migrating a NetWare server across-the-wire, rather than using MIGRATE.EXE for both bindery and file migration (see Chapter 4, “Upgrade Using “Across-the-Wire” Option of MIGRATE.EXE,” on page 77).

Note For a graphical look at how DS Migrate works in conjunction with the NetWare File Migration utility and MIGRATE.EXE, see Figure 1-2 on page 4.

How It Works

Bindery Migration

DS Migrate converts bindery objects such as users, groups, queues, printers, print servers, etc., into NetWare Directory Services™ (NDS) objects.

DS Migrate migrates a NetWare 2.1*x*, 2.2 or 3.1*x* bindery through a three step process. Each step is discussed below.

The Discover Step

From a NetWare client running Windows* 3.1x or Windows 95* and logged in to a NetWare 4 server, the network supervisor connects to the NetWare 2.1*x*, 2.2, or 3.1*x* server whose bindery is to be migrated.

The network supervisor installs DS Migrate and then launches it through NetWare Administrator.

The network supervisor indicates the desired bindery server to discover. A report is generated, and the bindery is placed in a graphical structure that appears like a Directory tree. At this point, the bindery information is placed in the DS Migrate database where it can be modeled.

The Model Step

With the bindery displayed in a graphical Directory tree-like structure, the structure is saved in a "view." The network supervisor then modifies the view to his or her liking, including adding or deleting objects, moving objects, granting or deleting rights and trustee assignments, etc.

Changes made in the view do not affect the actual Directory tree until those changes are merged to the actual Directory tree during the configure step.

Once the modeling process is complete, the information displayed in the view can be configured (or merged) into the Directory tree.

The Configure Step

The network supervisor logs in or maps a drive to the NetWare 4.11 server. From there he or she configures the objects within the view.

Once all replicas have been updated, the new bindery information becomes part of the Directory tree.

File Migration

Once the NetWare 2.1*x*, 2.2, or 3.1*x* server bindery has been migrated, the server files are migrated using either the NetWare File Migration utility (for NetWare 3.1*x* servers) or MIGRATE.EXE (for NetWare 2.1*x* or 2.2 servers).

The NetWare File Migration Utility

The NetWare File Migration utility is a GUI utility that is run from a NetWare Client™ running Windows 3.1*x* or Windows 95.

Files from a NetWare 3.1*x* server are copied by simply indicating the source and destination volumes in the utility's Wizard-based interface.

MIGRATE.EXE

MIGRATE.EXE is a DOS text-based utility that is run from a NetWare DOS client workstation.

When migrating NetWare 2.1*x* or 2.2 files after a bindery migration using DS Migrate, you choose the option to migrate data files only.

Items Migrated to NDS

The following bindery information is converted to NDS™:

- All user account restrictions
- Mail directories and contents (for NetWare 3.1*x* servers only)
- Default user account restrictions

Default user account restrictions become the properties of USER_TEMPLATE.

- User login scripts—both bindery and NDS (for NetWare 3.1*x* servers only)
- Group memberships and security equivalencies
- Novell print servers, queues, and printers
- User printjob configurations
- System login script

  The instructions within the System login script become part of the Container login script.
- User bindery login scripts (for NetWare 3.1*x* servers only)
- Directory level trustee assignments

  DS Migrate also creates the directories where trustees exist.

  When migrating a NetWare 2.1*x* server, you must have DS Migrate create the directories and associated trustees. When migrating a NetWare 3.1*x* server, the directories and associated trustees are created using the NetWare File Migration utility.
- File level trustee assignments (for NetWare 3.1*x* servers only)

  Working in conjunction, DS Migrate and the NetWare File Migration utility assure that file level trustee assignments are migrated properly.

Items Not Migrated to NDS

The following bindery information is not converted to NDS:

- User passwords

  Passwords can be assigned globally or individually in the modeling process.

- Printer definition database
- Mail directories (for NetWare 2.1*x* or 2.2 servers only)

NetWare Server Files Migrated/Not Migrated

The NetWare File Migration utility migrates all NetWare 3.1*x* server files and subdirectories *except* for the following:

- TTS$LOG.ERR from each migrated volume
- VOL$LOG.ERR from each migrated volume
- All files in SYS:SYSTEM
- The SYS:SYSTEM\NLS subdirectory
- All files in SYS:PUBLIC
- All files in SYS:/PUBLIC/OS2
- All files in SYS:PUBLIC/UNIX
- All files in SYS:PUBLIC/NLS
- All files in SYS;PUBLIC/CLIENT
- The SYS:LOGIN directory
- The SYS:ETC directory
- Any files that are currently open

MIGRATE.EXE migrates all NetWare 2.1*x* or 2.2 server files *except* for the following:

- Files that have the same name on the destination server
- A portion of the NetWare 2.1*x* or 2.2 system files
- Any files that are currently open

Directories that have the same name on the destination server are merged.

Preparing for Migration

Prior to migration, you must do the following:

- Meet all client workstation system requirements
- Make accommodations for SAP filtering
- Install NetWare Administrator

Client Workstation System Requirements

To run DS Migrate, the NetWare File Migration utility, and NetWare Administrator, your NetWare client workstation must meet the following system requirements:

- Windows 3.1*x* or Windows 95
- VLM or NetWare Client 32 software
- At least 8 MB of RAM
- 1.2 MB of free disk space for NetWare Administrator
- 3 MB of disk space for each NetWare server discovered
- The following line included in your CONFIG.SYS file:

  ```
  FILES = 40
  ```

Make Accommodations for SAP Filtering (Conditional)

If you plan to use the NetWare File Migration utility to migrate NetWare 3.1*x* server files to a NetWare 4 server, you should first ensure that SAP filtering is disabled on each server. If SAP filtering cannot be disabled, you should ensure that the default server (preferred server) for the client workstation through which you are running the utility is on the same LAN segment as the other servers you are migrating to and from.

You can change the default server setting for the client workstation you are running the utility from by using the Preferred Server setting. You

can set this parameter in the "Novell NetWare Client 32" properties under the "Network" control panel icon for Windows 95 workstations, or in the NET.CFG file for NetWare Client for DOS and Windows workstations.

If either of the two servers that you are using for the migration exist across a routed LAN segment, you must ensure that SAP filtering is disabled.

Install NetWare Administrator (Conditional)

DS Migrate and the NetWare File Migration utility are launched through NetWare Administrator. If you do not have NetWare Administrator already installed, you must install it at this time.

For a Client Running Windows 3.1*x*

Prerequisites

- ❑ A workstation cabled to the network and running Windows 3.1*x*
- ❑ 1.2 MB of free disk space on the workstation
- ❑ A drive mapping to SYS:PUBLIC on a NetWare 4.11 server
- ❑ Authentication to a NetWare Directory tree

Procedure

1. **In Program Manager, choose the NetWare Tools program group you want to start NetWare Administrator from.**
2. **From the Program Manager "File" menu, choose "New."**
3. **Choose "Program Item" and choose "OK."**
4. **Enter "NWADMIN" in the "Description" field and press** <Tab>**.**
5. **Choose "BROWSE."**
6. **From the "Drives" drop-down list, choose the drive that points to SYS:PUBLIC.**

7. **From the list under "File Name," choose NWADMN3X.EXE and choose "OK."**

   The path to the executable file is placed in the "Command Line" text box.

8. **Again, choose "OK," and then choose "Yes."**

   NetWare Administrator is created as a program item icon in the group you selected.

9. **Before exiting Windows, from the "Options" menu, choose "Save Settings on Exit."**

For a Client Running Windows 95

Prerequisites

- ❑ A workstation cabled to the network and running Windows 95 and Novell Client 32 software
- ❑ 1.2 MB of free disk space on the workstation
- ❑ A drive mapping to SYS:PUBLIC on a NetWare 4.11 server
- ❑ Authentication to a NetWare Directory tree

Procedure

1. **From the Windows 95 desktop, right click and choose "New."**
2. **Choose "Shortcut."**
3. **In the Command Line text box, enter**

   `Z:\PUBLIC\NWADMN95.EXE` <Enter>

4. **Choose "Finish."**

   NetWare Administrator is created as a shortcut icon on your desktop.

Run DS Migrate

This process involves running DS Migrate to migrate the NetWare 2.1*x*, 2.2, or 3.1*x* server's bindery. The procedures are divided into the three substeps: discover, model, and configure.

The procedures that follow are those required to migrate a single volume NetWare server to a single volume NetWare 4.11 server. Based on your source and destination server configurations, the procedures below may need to be modified to address your server configuration needs.

Discover the NetWare Bindery

Prerequisites

- ❑ From a NetWare client running Windows 3.1*x* or Windows 95, log in or map a drive to a NetWare 4.11 server (as a user with Supervisor rights) from which you can run the NetWare Administrator utility.
- ❑ From the same workstation, establish a network connection (as a user with Supervisor rights) to each bindery server to be migrated.

Procedure

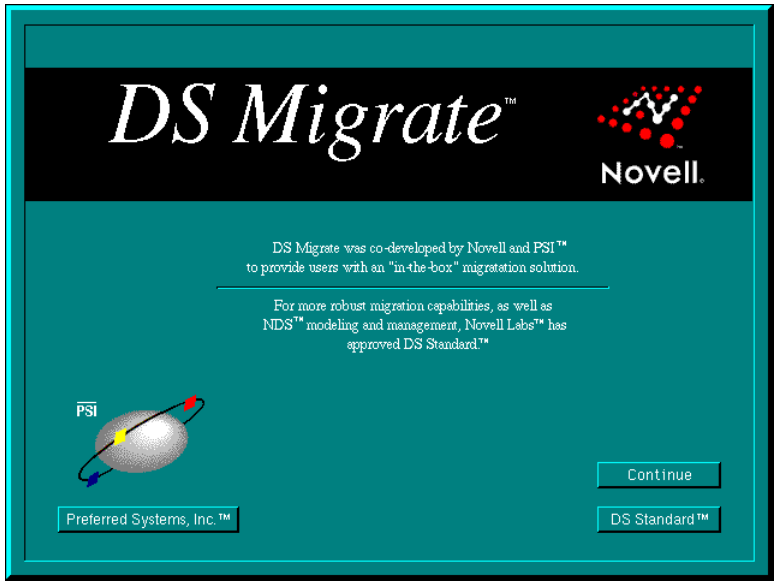
The procedures in the following sections are somewhat condensed. Along with these procedures, we recommend that you use the comprehensive Windows online help that is built in to the DS Migrate utility.

You can access DS Migrate's help system's table of contents through the "Help" menu, or by clicking the "Help" button (located on the far-right end of the toolbar). You can access context-sensitive help by pressing <F1>.

1. **Launch NetWare Administrator by double-clicking the "NWADMIN" icon.**
2. **From the "Tools" menu, choose "DS Migrate."**

   The following screen appears.

Figure 3-1
The First DS Migrate Screen



3. **Click “Continue.”**

   The DS Migrate main window appears.

4. **Discover the bindery server you are mapped to by choosing “Bindery View” from the “New View” submenu from the “File” menu.**

Note

You can also discover the bindery view by clicking the “Bindery Discover” toolbar button (the second button from the left) on the toolbar.

The “Enter New View from Bindery” screen appears.

5. **Enter the view name and author for the new view and click “OK.”**

Note

For information on views, refer to the DS Migrate online help.

The “Specify Discover Parameters” dialog box appears.

6. **Choose the server to discover, and the information you want discovered, and click “OK.”**

   The bindery objects you chose are discovered. DS Migrate then generates a report displaying all of the information ascertained in the discover.

7. **Review the report for any errors (listed at the bottom of the report) and close it when finished.**

   The report is saved on the server in the BINDDISC.LOG file.

   The NetWare bindery appears in a graphical Directory tree-like structure where it can be modeled.

8. **Continue with "Model the NetWare Bindery."**

Model the NetWare Bindery

With the NetWare 3.1*x* bindery information discovered and saved to the DS Migrate database, you can now begin the modeling process.

All bindery objects are placed into an Organizational Unit (OU) which is given the same name as the server being upgraded. These objects can be renamed, moved, or modified as desired. In addition, new Directory tree objects can be created. During the modeling process, object properties, and login scripts can be created or edited as well.

The modeling changes affect only the DS Migrate database. The original bindery objects in the NetWare 2.1*x*, 2.2, or 3.1*x* server and the actual NetWare 4.11 Directory tree where these objects eventually reside are left untouched until the configure process.

Modeling Considerations

It is important that the modeled tree structure be similar to that of the NetWare 4.11 Directory tree. Specifically, the container, server, and volume objects that exist in the actual NetWare 4.11 Directory tree *above* the objects being migrated should also exist in the modeled tree.

If the names of the source (NetWare 2.1*x*, 2.2 or 3.1*x*) server and destination (NetWare 4.11) server are different, the following objects and properties must be modified during the modeling process:

- User and group trustee assignments (for NetWare 2.1*x* or 2.2 servers only)

  These must be modified so that the path names where these assignments exist on the bindery server reflect the new path names in the NetWare 4.11 volume structure.

- Print queues

  These must be modified to reflect the new NetWare 4.11 volume names where the queue directories reside.

- Login scripts

  These may require modifications to reflect new server and volume names.

- Printjobs

  These may require modification to reflect new queue information.

Prior to modeling a Directory tree, you should have a sufficient understanding of NetWare Directory Services and proper Directory tree structure. For information see Chapter 3, “Designing the Directory Tree Structure” in *Guide to NetWare 4 Networks*.

Model the Print Queue Objects

Procedure

1. **Rename the discovered bindery server and volume objects to match the names of those in the actual NetWare 4.11 Directory tree.**

   This is done by double-clicking on the object and then modifying the “Name” field.

2. **Verify that all print queue objects’ volume properties now reflect the actual NetWare 4.11 volume names by double-clicking the queues and reading the “Volume” property.**

3. **Add or rename container objects (the Organization and Organizational Units) in the view as needed so that the tree structure *above* the container holding the discovered objects appears identical to the actual NetWare 4.11 Directory tree where these objects will be migrated.**

4. **Drag and drop all NetWare 2.1*x*, 2.2, or 3.1*x* server and volume objects that were renamed in Step 1 into the proper containers to match the locations of the actual server and volume objects in the NetWare 4.11 Directory tree.**

5. **(Conditional) If you are migrating a NetWare 2.1*x* or 2.2 bindery, continue with "Model the File System Trustees (Conditional)." Otherwise, continue with "Configure the NetWare Bindery to the Directory Tree."**

Model the File System Trustees (Conditional)

You need to perform this procedure only when modeling NetWare 2.1x or 2.2 binderies. This step is not needed when modeling NetWare 3.1x binderies because file system trustee assignments are migrated through the NetWare File Migration utility.

Procedure

1. **Highlight all user and group objects.**

   The Filter button from the toolbar (the funnel) can be used to filter object types, then the Leaf button can be used to select all.

2. **From the "View" menu, choose "Find and replace."**

3. **Choose "Trustee" from the "Find and Replace" menu now displayed. Then choose "Find."**

   The "Trustee Assignment" dialog box appears.

4. **In the top text field of the "Trustee Assignment" window, enter the name of the NetWare 2.1*x*, 2.2 server.**

5. **Choose the radio button labeled "Replace."**

6. **Check the box labeled "Replace UNC path."**

7. **In the bottom text field, enter the new NetWare 4.11 server name, then click "Find."**

   A list of trustees is built and displayed showing usernames and trustee paths.

8. **Choose each individual path to be updated, or click "Select All," then "OK."**

9. **When prompted, choose the desired action of "Yes," "Yes to All," "No," or "Cancel."**

When the replace procedure is complete, a log file is displayed.

10. **Review the log file for any errors (listed at the bottom of the report) and close it when finished.**

11. **Choose "Cancel" to return to the view.**

12. **Continue to model the tree as desired.**

    The end result should be a tree whose "skeleton" looks identical to that of the existing NetWare 4.11 Directory tree. This means that the Organization, Organizational Units, server, and volume objects that exist in the actual tree *above* those objects being migrated, and upon which these objects depend, also exist in the modeled tree.

13. **Once the modeling is complete, verify the dependencies of all objects.**

    13a. Remove any filters by clicking the "Filter" button.

    13b. Highlight all objects by clicking the "Tree" button.

    13c. From the "View" menu, choose "Verify Object Dependencies."

    13d. Click "OK" to verify the object dependencies.

    13e. Review the log file for any errors and close it when finished.

    13f. From the "View" menu, choose "Resolve References For Selected Objects."

    13g. Click "OK" to continue.

    13h. Review the log file for any errors and close it when finished.

Configure the NetWare Bindery to the Directory Tree

With the modeling process completed, you are ready to configure (or merge) the modeled bindery to the Directory tree.

Prerequisites

- ❑ From a NetWare client running Windows 3.1*x* or Windows 95, log in or map a drive (as ADMIN or a user with Supervisor rights) to a NetWare 4.11 server.
- ❑ Launch NetWare Administrator, and then select “DS Migrate” from the “Tools” menu to launch DS Migrate.

Procedure

1. **From the “File” menu, choose “Open View.”**
2. **Choose the desired view and click “OK.”**
3. **Activate the desired view.**

   Consistent with NDS security, you must have sufficient rights to configure selected objects and containers.
4. **From the “Tools” menu, choose “Options.”**
5. **Click the “Configure” button.**
6. **Decide if you want directory trustees configured for directories which do not yet exist on the destination NetWare 4.11 server (these are directories that have not yet been migrated through the file migration process).**

If	Then
You are configuring NetWare 2.1*x* or 2.2 bindery information	Check the “Create trustee directories if they do not exist” check box in the “Configure” dialog box.
You are configuring NetWare 3.1*x* bindery information	Uncheck the “Create trustee directories if they do not exist” check box in the “Configure” dialog box.

You can access the “Configure” dialog box by choosing “Options” from the “Tools” menu and then clicking the “Configure” button.

7. **Set other desired configuration options in the "Configure" dialog box.**

   These include password and object merge options.

8. **When all desired options have been set, click "OK."**

9. **From the "View" menu, choose "Configure All Objects."**

   A preconfiguration verification is run. The preconfiguration verification checks that the integrity of the objects are complete and can be merged into the NetWare 4.11 Directory tree.

   When the preconfiguration verification is complete, a dialog appears indicating so. If errors were encountered, the dialog indicates this as well.

If	Then
The dialog indicates that there were errors	Click "Cancel" to close the dialog and go back and correct the errors in the view. Or Click "OK" to ignore the errors and configure. Note: Any preconfiguration errors must be corrected either before or after configuration. If you ignore the errors at this time, you will need to correct them after the configuration.
No errors are indicated in the dialog	Click "OK" to configure.

The time required for bindery information to configure itself in the Directory tree varies according to the number of objects in the current view.

Once configured, a report appears.

10. **Review the report for errors and then close it.**

    Errors are documented at the bottom of the report.

11. Perform additional measures as needed.

Item	Action needed
User passwords	Establishing them on the NetWare 4.11 server This will depend on the password options you set in Step 7 on page 70.
Login scripts	May need to be updated to reflect new server and volume names
Printjob files	May need to be updated to reflect new queues

12. Continue with "Migrate Server Files."

Migrate Server Files

Use the table below to decide what procedures to use for migrating your server files.

If	Go to
You are migrating NetWare 3.1*x* server files	"File Migration Overview."
You are migrating NetWare 2.1*x*, or 2.2 server files	"Running MIGRATE.EXE" on page 88 in Chapter 4, "Upgrade Using "Across-the-Wire" Option of MIGRATE.EXE." When you get to Step 15, mark only "Data Files."

File Migration Overview

Once the NetWare 3.1*x* bindery has been migrated, the NetWare 3.1*x* server files are migrated using the new NetWare File Migration utility.

Like DS Migrate, the NetWare File Migration utility is launched through the "Tools" menu of the NetWare Administrator utility.

The NetWare File Migration utility must be run on the same workstation you used to run DS Migrate.

The NetWare File Migration utility allows you to easily migrate server volumes by simply having you indicate the source server and the specific volume and subdirectory on the destination server.

The NetWare File Migration utility uses a Windows help wizard. The wizard provides visible online help for each "page" of the utility's interface.

Prepare to Migrate NetWare 3.1*x* Server Files

Make sure each of the following is true for your setup.

- ❑ You must have Supervisor or Supervisor Equivalent rights to both the source (NetWare 3.1*x*) and destination (NetWare 4.11) servers.
- ❑ (Conditional) If any of the volumes you are going to migrate contain files with non-DOS naming conventions, load the appropriate name spaces on the destination volumes.
- ❑ In the SYS:SYSTEM directory on the source server, update the NLMs with the following NLMs located on the *Operating System* CD-ROM in PRODUCTS\NW3X:

For a NetWare 3.11 source server	For a NetWare 3.12 source server
TSA311.NLM	TSA312.NLM
SPXS.NLM	SPXS.NLM
TLI.NLM	TLI.NLM
CLIB.NLM	CLIB.NLM
AFTER311.NLM	AFTER311.NLM
A3112.NLM	A3112.NLM
SMDR.NLM	SMDR.NLM
STREAMS.NLM	STREAMS.NLM

- ❑ On the source server, load TSA31*x*.NLM

❑ (Conditional) If you are migrating volumes with Macintosh name space support and the MAC.NAM file is earlier than version 3.12, dismount the volume, unload MAC.NAM, load the 3.12 version of MAC.NAM (located in PRODUCTS\NW3X) and then run VREPAIR.

32-character Macintosh filenames are renamed during file migration. To maintain filenames, reduce 32-character filenames prior to running the NetWare File Migration utility.

Migrate the Server Files

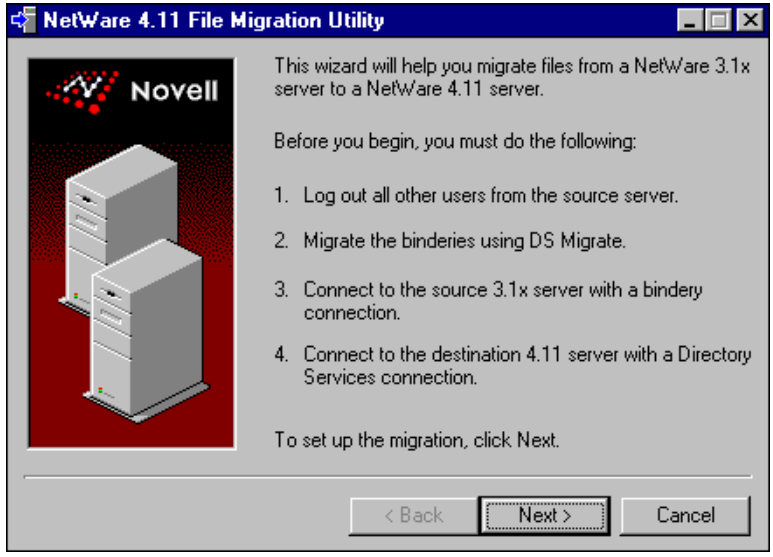
Procedure

Procedure

1. From the "Tools" menu in the NetWare Administrator utility, choose "File Migration."

The following screen appears.

Figure 3-2
The First NetWare File Migration Utility Screen



Be sure to follow the directions on each of the wizard pages before continuing.

2. Click the "Next" button to continue.

A new screen appears where you can indicate the source server and volume whose files you want to migrate.

3. **In the "Source server" field, click the down arrow and choose the desired NetWare 3.1*x* server.**

4. **In the "Source volume" field, click the down arrow and choose the desired volume for the server you selected.**

5. **Click the "Next" button to continue.**

   A new screen appears with a field for you to type the source server password.

6. **In the "Password" field, type the NetWare 3.1*x* server password.**

7. **Click the "Next" button to continue.**

   A new screen appears where you indicate your destination server, volume object, and directory path.

8. **In the "Destination server" field, click the down arrow and choose the server you want to migrate the files to.**

9. **In the "Destination volume" field, click the down arrow and choose the volume you want to migrate the files to.**

10. **In the "Destination directory" field, click the down arrow and choose the directory you want the files migrated to.**

    Destination directories must be located at the root of the volume.

11. **Click the "Next" button to continue.**

    A new screen appears with a field for you to type the destination server password.

12. **In the "Password" field, type the NetWare 4 server password.**

13. **Click the "Next" button to continue.**

    At this point, the NetWare File Migration utility

    - Verifies that the source and destination information you entered is valid and can be migrated.

- Verifies that you have appropriate rights to the source and destination servers.
- Locates and reads the DS Migrate name mapping file created by DS Migrate.
- Reads all users and groups on the source server and checks for the NDS name property.
- Disables login privileges for all users who are not currently logged in to the source server.
- Reads the name space information on the source and destination volumes.

If you encounter problems, specific messages or dialogs appear that require your input to fix the problems.

14. Click the "Migrate" button to begin the file migration.

The "Migrating Files" screen appears showing the progress of the migration. You can stop the migration by clicking the "Stop" button.

If you are migrating	Then
Filenames that already exist on the destination server	The migrated file is renamed. The log file MIGRATE.LOG displays the name of the renamed file.
Directories that already exist on the destination server	The directory contents are merged into the directory with the same name.

At this point, the NetWare File Migration utility automatically loads the TSA410.NLM and MAP3XIDS.NLM on the destination server.

A screen informs you when the migration for the server volume is complete.

You can view the migration log by clicking the "View log" button. The log is stored as MIGRATE.LOG in the root of the destination path.

15. Migrate another server volume or exit the utility.

If you want to	Then
Migrate another server volume	Click the “Again” button. The screen shown in Figure 3-2 appears. Click the “Next” button and start the file migration process again, beginning with Step 2.
Exit the NetWare File Migration utility	Click the “Done” button.

chapter 4

Upgrade Using "Across-the-Wire" Option of MIGRATE.EXE

Overview

The "Across-the-Wire" option of the MIGRATE.EXE utility allows you to migrate NetWare® 2.1*x*, NetWare 2.2, or NetWare 3.1*x* bindery information and files to an existing NetWare 4™ server and corresponding Directory tree via a DOS client workstation.

MIGRATE.EXE does not include the modeling functionality that is built into DS Migrate. If you want to model your bindery prior to migrating it, we recommend using DS Migrate (see Chapter 3, "Upgrade Across-the-Wire Using the DS Migrate Utility," on page 55).

You can use Across-the-Wire Migration when upgrading from

- NetWare 2 (specifically, NetWare 2.1*x* and NetWare 2.2) to NetWare 4.11.
- NetWare 3™ (specifically, NetWare 3.11 and NetWare 3.12) to NetWare 4.11.
- Another network operating system (specifically, IBM* PCLP 1.3 Extended Services; IBM LAN Server* 1.0, 1.1, 1.2, 1.3; and Microsoft* LAN Manager* 2.0) to NetWare 4.11.

How It Works

In an Across-the-Wire Migration, data files are migrated across the network from the source server to the NetWare 4.11 server.

Selected bindery information is migrated to the working directory on the client workstation and translated to the NetWare 4.11 format, and then migrated to the NetWare 4.11 server through bindery services. Bindery services emulates a flat structure for the objects within an NDS™ Directory tree.

MIGRATE.EXE lets you select specific information from the bindery and data files so that you can upgrade a server and create a customized NetWare 4.11 server. MIGRATE.EXE leaves the source server intact and only copies information to the NetWare 4.11 server.

Across-the-Wire Migration allows you to preserve your user environment (users and their trustee assignments) as well as the default account restrictions and accounting methods.

For a graphical look at how the Across-the-Wire Migration using MIGRATE.EXE works, see Figure 1-3 on page 5.

Running MIGPRINT after the migration restores your print queues and print servers.

Three Computers Needed

Three computers are needed to upgrade using Across-the-Wire Migration:

- A NetWare server running NetWare 2, NetWare 3, or another network operating system. This is called the *source server*.
- A NetWare server running NetWare 4.11. This is called the *NetWare 4.11 server*.
- A DOS workstation with NetWare Client™ software loaded. This is called the *client workstation*. MIGRATE.EXE runs on this client workstation.

Bindery Services Connection Necessary

A *bindery* is the database in NetWare 2 and 3 that contains definitions for entities such as users, groups, NetWare servers, and print servers. For more information, see “Bindery” and “Bindery services” in *Concepts*.

When you use MIGRATE.EXE, it is important to have only bindery connections, because the utility depends on bindery services to work properly. To ensure only bindery connections, log in to the NetWare 4.11 server using the bindery services (/b) option. For example, you might type

```
LOGIN SRV1/SUPERVISOR /B
```

Or use MIGRATE.EXE to log in to the NetWare 4.11 server.

NetWare Directory Services

In NetWare 4, NetWare Directory Services replaces the bindery, which served as the system database for previous releases of NetWare.

While the bindery supports the operation of a single NetWare server, NetWare Directory Services supports an entire network of servers. NetWare Directory Services is a single, logical database: all users, applications, and servers go to one database for information.

Users and groups are migrated into the bindery context of the NetWare 4.11 server. If multiple bindery contexts are set, the first context set is used.

Migrating Directories

- If a directory being migrated has the same name and path as a directory that already exists on the NetWare 4.11 server, the files from both directories are merged under the destination directory name.
- The directory structure and files are migrated and become a part of the NetWare 4.11 file system. If necessary, modify the organization on the NetWare 4.11 server after all the source servers are migrated.

Migrating Files

Any file (newer or older) on a source server that has the same name as one that exists on the NetWare 4.11 server is not copied to the NetWare 4.11 server.

An error message appears on the screen during the migration, and is also written to the migration report, to let you know that a file by that name already exists on the NetWare 4.11 server.

User Login Scripts and Mail Directories

The NetWare 2 or 3 user login script is simply a file called LOGIN that resides in the NetWare 2 or 3 users' MAIL directory. During migration

a new MAIL directory is created on the destination server for each migrated user. The name of the MAIL directory matches the user's new object ID (which is different than it was on the NetWare 2 or 3 server).

The user is given RWCEMF rights to the new directory. MIGRATE.EXE then copies the LOGIN file (if one exists) from the old MAIL directory to the new NetWare 4.11 MAIL directory.

Migrated users who had login scripts on the source server still execute those migrated login scripts when logging in to the new server as bindery users. Those same users have no login script when logging in as DS users.

UIMPORT can be used to convert bindery login scripts to DS login scripts (the files UIMPORT.CTL and UIMPORT.DAT are created in SYS:SYSTEM on the destination server during the migration). Alternatively, the NetWare Administrator utility (NWADMIN) or NETADMIN can be used to create scripts manually.

You should examine each user login script after the migration and make corrections if the server name or directory pathnames have been changed.

System Login Scripts

NetWare 2 and 3 system login scripts are simply text files in SYS:PUBLIC\NET$LOG.DAT. This file is migrated as part of the file system. Users logging in to the new server under bindery services run this system login script. DS users do not execute this file.

Container and Profile login scripts take the place of a system login script in the NetWare 4 environment and must be created in the NetWare Administrator utility or NETADMIN.

Migrating Users

- Users on the source server are created as new user objects on the NetWare 4.11 server.
- User login names and login scripts are copied.

- User account restrictions (such as account balance restrictions, expiration restrictions, password restrictions, and time restrictions) are copied.

- Users with the same username in the bindery context are merged; that is, their user information (login names and login scripts) are added together (except for user account restrictions, which are left untouched).

Table 4-1 shows the types and descriptions of information you can migrate using the Migration utility.

Table 4-1
Information that Can Be Migrated Using MIGRATE.EXE

Data Type	Description	Limitations
All Information	Migrates all the information listed in this table.	
Data Files	Migrates all data files and the DOS and NetWare attributes for files and directories.	Does not overwrite a file or directory with the same name.
Trustee Assignments	Migrates rights that are assigned to users and groups for directories and files. (Automatic conversion to NetWare 4.11 rights.)	With this selection, you must also choose Users, Groups, and Data Files if the users and data files in question do not already exist on the NetWare 4.11 server.
Users	Migrates user account names and copies user login scripts to the new mail directory.	Does not overwrite existing items on the NetWare 4.11 server. Login scripts are not converted to NDS format.
User Restrictions	Migrates user account restrictions.	Does not include user volume restrictions. If this type is chosen, users must also be migrated. Does not overwrite existing restrictions on the NetWare 4.11 server.
Groups	Migrates the group members and group trustee rights for directories and files.	If a group from the source server already exists on the NetWare 4.11 server, the source and destination groups are merged.

Table 4-1 *continued*

Information that Can Be Migrated Using MIGRATE.EXE

Data Type	Description	Limitations
Default Account Restrictions	Migrates default account restrictions.	
Accounting Information	Migrates the accounting charge method chosen to charge for network services charged to individual user accounts.	
Print Queues and Print Servers	MIGPRINT.EXE is necessary for migrating NetWare print queues and print servers and their corresponding setup information.	The source and destination information are merged.

Table 4-2 describes how NetWare 2.*x* or 3.*x* user designations migrate to NetWare 4.11. The account restrictions are *not* merged.

Table 4-2

NetWare User Designations

In NetWare 2.*x* or 3.x	In NetWare 4.11
User account manager (NetWare 2.1*x* and 2.2 only)	Has Supervisor rights to objects managed (Object Supervisor property). Cannot create new objects.
Workgroup manager (NetWare 2.1*x* and 2.2 only)	Has Supervisor right to the User objects that were created in NetWare 2.*x*.
Console operator	Becomes an Operator property of the NetWare Server object.
Security equivalence	Becomes a value of the Security Equivalence property of the User object.

NetWare 2 Rights and Attributes

In NetWare 2.*x*, rights are assigned only at the directory level. In NetWare 4, rights are assigned at the file and directory levels.

When you use Across-the-Wire Migration, all NetWare 2.*x* rights and attributes are translated into the NetWare 4 format. The Maximum

Rights Mask is replaced with an Inherited Rights Filter (IRF), which allows rights to flow down the file system directory structure.

Migrating Passwords

Passwords are not migrated. The Migration utility allows you to either

- Assign passwords that are generated randomly for all migrated users.
- Allow users to log in to the new system without a password.

Randomly generated passwords are stored in a file called NEW.PWD in SYS:SYSTEM on the NetWare 4.11 server, and can be accessed only by the User object ADMIN.

Preparing for Migration

During the migration process, you set up your migration on a configuration form. This configuration form focuses on the following three areas:

- Preparing the NetWare 4.11 server
- Preparing the source server
- Preparing the client workstation

Preparing the NetWare 4.11 Server

Prerequisites

- ❑ On the NetWare 4.11 server, create the volumes that you want to migrate data to. MIGRATE.EXE does not create volumes.

  Create a directory to migrate the NetWare 2.*x* or 3.*x* volume SYS: to so that you can remove unnecessary NetWare 2.*x* or 3.*x* files more easily. Create a directory on volume SYS: that corresponds to the volume on the NetWare 2.*x* or 3.*x* server.

- ❑ Since two servers on the same network cannot share the same name, the NetWare 4.11 server must have a unique name.

- ❑ Set the bindery context to the container into which bindery objects are to be migrated. For example:

  SET BINDERY CONTEXT=.OU=USERS.O=NOVELL

- ❑ Make sure that all users, except ADMIN, are logged out of the NetWare 4.11 server and that all files are closed.

- ❑ (Optional) Prepare for long name file support (such as Macintosh*, OS/2*, and NFS*).

  To store long filenames and folders on the new NetWare 4.11 server, add name space support to any volume that needs to store files with long names. For more information, see "ADD NAME SPACE" in *Utilities Reference*.

- ❑ Plan for disk space on the NetWare 4.11 server.

  If you merge two or more NetWare 2.*x* or 3.*x* servers onto the same NetWare 4.11 server, plan for sufficient free disk space for the NetWare 4.11 volume SYS:. Volume SYS: requires at least 75 MB of disk space.

Creating New Home Directories on the NetWare 4.11 Server

The following procedures discuss how to set up a property in the bindery context of the NetWare 4.11 server so that MIGRATE.EXE knows where to create home directories.

1. **Log in to the NetWare 4.11 server as ADMIN.**

2. **On the server you are upgrading, map a drive to the volume where SYSCON is stored.**

   This is usually the PUBLIC directory on volume SYS: of a NetWare 3.1*x* server. SYSCON is not available in NetWare 4.

3. **Change to the mapped drive letter.**

4. **Type**

   SYSCON <Enter>

5. **From the "Available Topics" menu, choose "Supervisor Options" and press** <Enter>**.**

6. **Choose "Default Account Balance/Restrictions" and press** <Enter>**.**

   The "Default Account Balance/Restrictions" menu appears.

7. **Choose "Create home directory for user" and press** <Enter>**.**

8. **Change the response to "Yes" by typing "Y" and pressing** <Enter>**.**

9. **Press** <Esc> **to return to the "Available Topics" menu.**

10. **Choose "User Information" and press** <Enter>**.**

11. **Press** <Ins>**.**

    The "User Name" entry box appears.

12. **Enter a username and press** <Enter>**.**

    For example, "dummy."

    SYSCON presents a path for the user home directory. For example:

    SYS:\dummy

13. **Replace everything in the path that precedes the username with the path where you want the home directories placed during the migration.**

    For example:

    SYS:\USERS\dummy

14. **Press** <Enter> **to set the home directory for the user.**

    If that user's home directory does not yet exist, you are asked if you want to create it.

15. **Choose "Yes" to create the new directory.**

    The default home directory is now established and the user you created in Step 12 is no longer needed.

16. **Press** <Delete> **to delete the username.**

Using the example above during the migration, all of the user home directories are placed in SYS:\USERS directory.

Preparing the Source Server

Prerequisites

- ❑ Back up your source server.

  Use your regular backup utility to back up your current NetWare 2.*x*, NetWare 3.*x,* or other network operating system server at least twice to ensure a good copy.

- ❑ Make sure that all users, except ADMIN (or SUPERVISOR), are logged out of the source servers and that all files (except bindery files) are closed during migration.

- ❑ Delete unnecessary files.

  Decide if you want to migrate .BAK or .LST files, or any other temporary files. You might want to consolidate some files and directories.

  Value-Added Processes (VAPs) are not compatible with NetWare 4.11. You should delete them before you start the migration.

- ❑ Rename DOS directories and files that have long names.

  NetWare 2.*x* supports 14-character directory and file names. NetWare 4.11 supports DOS naming conventions—eight-character name, three-character extension—for DOS directories and files.

  Only DOS directories and files that conform to DOS naming conventions (8.3) are migrated.

  Macintosh and OS/2 files can still follow their respective naming conventions.

- ❑ Modify the subdirectory depth to 25 levels.

  NetWare 4.11 sets the default subdirectory depth to 25 levels; therefore, the MIGRATE.EXE does not copy subdirectories deeper than 25 levels.

If the source server has subdirectories deeper than 25, modify the subdirectory structure so that the subdirectories aren't so deep.

- ❑ Run BINDFIX on the source server.

  BINDFIX can delete mail subdirectories and trustee rights of all users who no longer exist on the source server.

Preparing the Client Workstation

Prerequisites

- ❑ A DOS workstation with at least 640 KB of memory (with 480 KB of free memory) and 5 MB of free disk space on either a hard disk or another network drive that can attach to both the source server and NetWare 4.11 server.

- ❑ Make sure that your network connection is a bindery connection.

  If you are authenticated to the NetWare 4.11 server, you must log in with a bindery connection or log out and use MIGRATE.EXE to log in.

- ❑ Make sure the CONFIG.SYS file includes the following line:

  ```
  files=20
  ```

  If you add the line to the CONFIG.SYS file, save the file and then reboot the workstation.

- ❑ Make sure the NET.CFG file includes the following lines:

  ```
  Protocol IPXODI
    IPX retry count=60
  ```

- ❑ Load your LAN drivers on the DOS workstation and run the NetWare Client software.

Running MIGRATE.EXE

Procedure

1. Access the MIGRATE directory using one of the options below.

If	Then
Your client workstation has a CD-ROM device	Use the NetWare 4.11 *Operating System* CD-ROM and change to the MIGRATE subdirectory.
Your network includes a NetWare 4.11 server that had a MIGRATE subdirectory created during installation	Map a drive to the server's volume SYS: and go to the MIGRATE subdirectory.
Your client workstation does not have a CD-ROM device, nor access to a NetWare 4.11 server with a MIGRATE subdirectory	Create migration diskettes at the server using INSTALL.NLM. Use the migration diskettes to create a MIGRATE subdirectory on the client workstation. Or Install the MIGRATE subdirectory on the NetWare 4.11 server using INSTALL.NLM. Then map a drive to the server's volume SYS: and go to the MIGRATE subdirectory.

2. From the client workstation, log in to the NetWare 2.1*x*, 2.2, or 3.1*x* server.

3. (Conditional) From the client workstation, map a drive to the NetWare 4.11 server using the MAP command.

If you already mapped a drive to a NetWare 4.11 server in Step 1, you do not need to do this.

4. **When prompted for the user name, enter "SUPERVISOR" and press** <Enter>**.**

5. **Type the supervisor password and press** <Enter>**.**

MIGRATE.EXE places all migrated objects into the *first* bindery context set on the NetWare 4.11 server.

6. **From the client workstation, start MIGRATE.EXE by changing to the directory that contains the Migration utility files and typing**

   `MIGRATE` <Enter>

   The "Select the Type of Migration" menu appears.

7. **From the "Select the Type of Migration" menu, choose "Across-the-Wire Migration" and press** <Enter>**.**

   The "Select Source LAN Type" menu appears.

8. **Choose a source LAN type (NetWare 2.*x*, NetWare 3.*x*, LAN Server/PCLP, or LAN Manager) and press** <Enter>**.**

   The "Select the Destination LAN Type" menu appears.

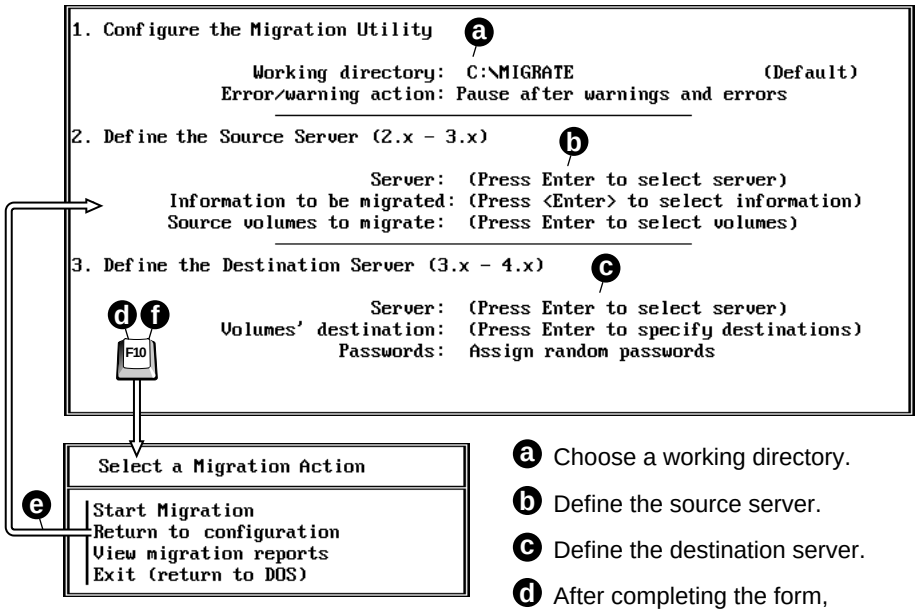
9. **Choose a destination LAN type (4.x) and press** <Enter>**.**

   When selecting a source and destination, MIGRATE.EXE does version checking according to the source type and destination type you selected.

   The "Migration Utility Configuration" form appears.

   "The Migration Utility Configuration Form" on page 90 illustrates the process of filling out the configuration form used with the Migration utility. The corresponding migration steps are noted where applicable.

Figure 4-1
The Migration Utility Configuration Form



- **a** Choose a working directory.
- **b** Define the source server.
- **c** Define the destination server.
- **d** After completing the form, press <F10> to display the "Select a Migration Action" menu.
- **e** If any changes are necessary, choose "Return to Configuration" from the menu.
- **f** After changes are made, press <F10>. Choose an action and press <Enter>.

10. **Under Step 1, "Configure the Migration Utility," on the configuration form, press** <Enter> **to change the working directory (if desired), then press the Down-arrow key to move to the next field.**

    The working directory is where the bindery information and the migration reports are stored. Data files are not stored here. You need 5 MB of free disk space in this directory.

    The working directory is usually located on the workstation's hard disk, but you can also put it on a network drive.

Note

If you are using a network drive instead of a workstation hard disk, you must have Create, Read, Write, and File Scan rights in the working directory.

If the working directory doesn't exist on the workstation hard disk or network drive, MIGRATE.EXE creates it for you.

11. Under Step 1 on the configuration form, press <Enter> **to toggle between error/warning actions.**

Important

All errors are listed in the report file regardless of the option you select.

Error/Warning Action	Description
Pause after warnings and errors	Choose this option if you want the utility to stop after each warning and error and prompt you to continue with the migration. Each time an error is reported and you are prompted, you can choose to discontinue the prompting.
Do not pause after warnings and errors	Choose this option if you do not want to be prompted after each warning and error.

12. Under Step 2, "Define the Source Server," on the configuration form, press <Enter> **to display a list of source servers.**

Note

For LAN Server or LAN Manager: If you are migrating from LAN Server or LAN Manager, the screen shows the domain obtained from the DOSLAN.INI file. Edit this field if the domain you are logged into is not the same as the one listed in the DOSLAN.INI file.

13. Choose the source server you want to migrate from and press <Enter>**.**

This selection must match the source type you specified in Step 8 on page 89 of this procedure.

If the source server you want to choose is not shown, press <Insert> to see a list of available servers you can log in to.

Note

When migrating multiple source servers, only one source server can be migrated at a time.

14. **Under Step 2 on the configuration form, press** <Enter> **again to display categories of information you want to migrate.**

For LAN Server or LAN Manager: If you are migrating from LAN Server or LAN Manager, you are limited to the following categories to migrate:

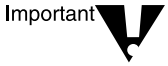
Access Control Profiles
All Information
Data Files
Groups
Print Queues
Users

Only files that conform to DOS naming conventions (8.3) are migrated.

15. **Using** <F5>**, mark the information you want to migrate and then press** <Enter>**.**

Follow the Quick Help for details on how to select information.

Mark as many categories as necessary.



If you choose “All Information,” all categories are migrated. However, printing environments are not migrated at this time. After the MIGRATE.EXE has finished, use MIGPRINT.EXE (documented in this chapter) to migrate your printing environment.

If you previously migrated the NetWare bindery using DS Migrate, choose only “Data Files.”

16. **Under Step 2 on the configuration form, press** <Enter> **again to display a list of source volumes on the source server you want to migrate data from.**

For LAN Server or LAN Manager: If you are migrating from LAN Server or LAN Manager, source *drives* are listed.

17. **Mark the volumes using** <F5>**, and then press** <Enter>**.**

Mark source volumes to migrate only if you are migrating data files or trustee assignments on those volumes.

You must choose a source volume (or a source drive in LAN Server or LAN Manager) to migrate if you choose any of the following categories to migrate:

All Information
Data Files

Trustee Assignments (or Access Control permissions in LAN Server or LAN Manager)

If you are migrating one or more of the following categories, you do not need to choose a source volume:

Accounting Information
Default Account Restrictions
Groups
Print Queues
User Restrictions
Users

18. **Under Step 3, "Define the Destination Server," on the configuration form, press** <Enter> **to display a list of servers on the network.**

19. **Choose the NetWare 4.11 server that you want to migrate the source server to and press** <Enter>**.**

    This selection must match the destination type you specified in Step 9 on page 89.

    If the NetWare 4.11 server you want to choose is not shown, press <Insert> to see a list of available servers that you can log in to.

20. **Under Step 3 on the configuration form, press** <Enter> **to select a volume (or source drive in LAN Server or LAN Manager).**

21. **Press** <Enter> **to specify the destination volume and optional directory on the NetWare 4.11 server.**

    Destination volumes that match the source volumes are displayed as the default.

    Press <Insert> to see a list of available volumes and directories on the NetWare 4.11 server.

Note

For LAN Server or LAN Manager: If you are migrating from LAN Server or LAN Manager, the list contains servers and drives.

If you specify a directory that does not exist on the NetWare 4.11 server, you are asked whether the system should create it. Volumes must already be created on the NetWare 4.11 server before you can migrate data to them.

Note

The volume organization, as well as the directory structure, is migrated. You can modify the organization on the NetWare 4.11 server after all the source servers have been migrated.

22. **Press** <Enter> **when you complete the destination path of the source volume.**

23. **If you have multiple source volumes, continue to specify destination paths.**

24. **Press** <F10> **when you finish filling out the "Volumes' Destination" field.**

25. **(Optional) Under Step 3 on the configuration form, press** <Enter> **and choose a password option.**

Note

For LAN Manager: If you are migrating from LAN Manager, password lengths are global. For example, if a user has a "password not required" flag set on the LAN Manager side, users have no passwords on the NetWare 4.11 server.

If a password is required and the length of the password is zero (0), the Migration utility assigns the destination default password length.

See the following table for a description of the options.

Password Option	Description
Assign Random Passwords (default)	A password for each username that has a password on the source is generated randomly and stored in a file (NEW.PWD) in SYS:SYSTEM on the NetWare 4.11 server. **Note:** New passwords are given only to users and print servers that had a password on the source server. Only users with rights to SYS:SYSTEM have access to this file. Users cannot log in until they are given their passwords from this list.

Password Option	Description
Assign no passwords	After you finish the migration, all users can log in using their previous usernames. They are not prompted for a password. Users have the option to create their passwords if no random passwords were issued upon migration. **Note:** If the user account restrictions require users to have a password, they are prompted to type a new password, which the system verifies.

26. Review the fields on the configuration form and make any necessary changes.

27. To proceed with the migration, press <F10> **to display the "Select a Migration Action" menu.**

28. Choose a "Migration Action" and then press <Enter>**.**

If you want to	Choose
Migrate all the information you chose from the source server to the NetWare 4.11 server All information about the migration is scrolled to the screen and entered into a report file, which you can review later. (The bindery information you chose is copied to the working directory and translated into the NetWare 4.11 format; it is then copied to the NetWare 4.11 server. The data files are migrated directly to the destination 4.11 server.)	"Start the Migration." During the migration, you can pause, stop, and toggle error and warning prompts using the <Enter>, <Esc>, and <F2> keys respectively.
Make changes to your migration configuration	"Return to Configuration."
Display reports (after the migration is complete)	"View Migration Reports."
Exit the utility and return to the DOS prompt	"Exit (Return to DOS)."

When the migration is complete, MIGRATE.EXE displays the following message:

```
Migration from the source server to the
destination server is complete. Press <Enter> to
continue.
```

29. (Conditional) If errors occur during the migration and you chose to be prompted after errors and warnings, you see the following:

```
A migration error has occurred and is displayed
in the migration log above. Do you want to
continue with the migration?
(Y=Yes/N=No/I=Ignore Error):
```

Use the following table to help you answer the prompt.

If you choose	Then
Yes	The migration continues. The error is written to the report file, and you are prompted again the next time an error occurs.
No	The migration stops. The error is written to the report file. You receive this message: Migration from the source server to the NetWare 4.11 server is finished. Press <Enter> to continue. Press <Enter> to return to the “Select a Migration Action” menu. From there, press <Esc> to edit the fields or choose “Exit” to leave the utility and return to the DOS prompt.
Ignore	The migration continues. The error is written to the report file. You are no longer prompted when an error occurs, but all errors are written to the report file.

For explanations of all error messages, see *System Messages*.

30. (Optional) To view the migration report, select "View Migration Reports" from the "Select a Migration Action" menu and continue with Step 30a.

30a. Select the report for the migration you completed and press <Enter>**.**

The reports reside in the working directory that you specified earlier (see Step 1 of the Configuration Form in Figure 4-1).

Use the report to help you complete and customize definitions, attributes, and access privileges on the NetWare 4.11 server. If you find errors on your NetWare 4.11 server after the migration, locate them in the migration report file and determine what actions to take on the NetWare 4.11 server to correct the errors.

The report file is an ASCII text file that consists of the following:

- Summary information of the bindery import phase (migrating bindery data from the source server to the working directory)
- Summary information of the bindery export phase (migrating bindery data from the working directory to the NetWare 4.11 server)
- A listing of each item in each category that was read from the source server
- A listing of each item in each category that was written to or created on the NetWare 4.11 server
- The number of errors that occurred during the migration

30b. To exit the report, press <Esc>**.**

30c. To return to the "Select a Migration Action" menu, press <Esc> **again.**

31. To exit MIGRATE.EXE, choose "Exit (Return to DOS)" and press <Enter>**.**

32. To upgrade your printing environment, continue with the next section, "Running MIGPRINT.EXE."

Running MIGPRINT.EXE

The MIGPRINT utility allows you to migrate printers, print queues, and print servers from your NetWare 2 or NetWare 3 source server into your NetWare 4 Directory tree.

Prerequisites

- ❑ Complete the Across-the-Wire Migration using MIGRATE.EXE.
- ❑ Make sure you have the Supervisor right on the NetWare 4.11 server.

Procedures

1. **From the client workstation, establish a NetWare Directory Services connection to the NetWare 4.11 server.**
2. **From the client workstation, establish a connection to the source server.**
3. **Access the MIGRATE directory using one of the options below.**

If	Then
Your client workstation has a CD-ROM device	Use the NetWare 4.11 *Operating System* CD-ROM and change to the MIGRATE subdirectory.
Your network includes a NetWare 4.11 server that had a MIGRATE subdirectory created during installation	Map a drive to the server's volume SYS: and go the MIGRATE subdirectory.

If	Then
Your client workstation does not have a CD-ROM device, nor access to a NetWare 4.11 server with a MIGRATE subdirectory	Create migration diskettes at the server using INSTALL.NLM. Then use the migration diskettes to create a MIGRATE subdirectory on the client workstation. Or Install the MIGRATE subdirectory on the NetWare 4.11 server using INSTALL.NLM. Then map a drive to the server's volume SYS: and go to the MIGRATE subdirectory.

4. **Initialize a search drive by mapping a search drive to SYS:SYSTEM/NLS.**

5. **From the client workstation, start the MIGPRINT utility by changing to the directory that contains the migration utility files and typing**

   MIGPRINT /S=*source_server* **/D=***destination_server*
   [/VOL=*queue_volume* **/O=***output_file***]** <Enter>

   Replace *source server* with the name of the bindery server that you're migrating the print information from.

   Replace *destination server* with the name of the NetWare 4.11 server you're migrating to.

   (Optional) If you don't want to migrate to the default volume SYS:, replace *queue volume* with the name of another queue volume.

   (Optional) If you don't want to migrate to the default file, replace *output file* with the name of another file. For example:

   MIGPRINT /S=FS1 /D=FS2 /VOL=.FS2_SYS.NOVELL

6. **Review the log file created and correct any deficiencies.**

What to Do after Migration

After the migration is complete, check the NetWare 4.11 server and do the following if they apply:

- Update references to the server in the user login scripts.

  Although user login scripts are copied to the MAIL directory on the NetWare 4.11 server, they are not upgraded to DS login scripts, and server names and directory paths are not changed to match your new environment.

  You can use the UIMPORT utility to convert bindery login scripts to NetWare 4.11 Directory Services (NDS). UIMPORT allows you to import data from an existing database to the NDS database.

  For instructions, see Appendix E, “Importing User Data Into NDS Using UIMPORT” on page 161.

- Check third-party applications.

  In order for third-party applications to run properly under NetWare 4.11, you might need to reinstall them and / or enter new paths in their setup files.

  Reinstall third-party applications if

  - The application has an .EXE file that did not migrate.
  - The application is path-specific and you have changed the path structure during migration.

  Some DOS applications don’t work when installed on volumes that have more than 32 MB of disk space. Some of these applications can be made to work by doing the following:

  - Restrict the application’s directory on the NetWare 4.11 server with Object Manager (which replaces DSPACE).
  - Make the directory a fake root using MAP.

- Examine the files in merged directories and reorganize them if necessary.

- Check user restrictions and accounting charge rates to make sure your system is configured the way you want it.

- Set any new directory and file attributes.
- If you chose to assign random passwords, print the SYS:SYSTEM\NEW.PWD file and distribute the password information to your users. The users should change their passwords immediately.

  The report, an ASCII text file, shows passwords sorted by date. If users were migrated from more than one server, the current password is the last one listed on the report.
- If you have menus set up, you might need to run a menu conversion program so your menus function properly under NetWare 4.11.
- Establish user volume restrictions.

chapter 5

Upgrade Using "Same-Server" Option of MIGRATE.EXE

Overview

Same-Server Migration uses the MIGRATE.EXE utility to assist in converting an existing NetWare® 2, NetWare 3™, or another network operating system server to NetWare 4.11. After backing up the NetWare 2, NetWare 3, or another network operating system server, MIGRATE.EXE converts the server's bindery information to NetWare Directory Services™ following the installation of NetWare 4.11.

You can use Same-Server Migration when upgrading from

- NetWare 2 (specifically, NetWare 2.1*x* and NetWare 2.2) to NetWare 4.11.
- NetWare 3 (specifically, NetWare 3.11 and NetWare 3.12) to NetWare 4.11.
- Another network operating system (specifically, IBM PCLP 1.3 Extended Services; IBM LAN Server 1.0, 1.1, 1.2, 1.3; and Microsoft LAN Manager 2.0) to NetWare 4.11.

The preferred method of upgrading a NetWare 3.1*x* server to 4.11 is through INSTALL.NLM (see Chapter 2, "Upgrade Using INSTALL.NLM," on page 9). This is not only because INSTALL.NLM is a more seamless upgrade solution, but because INSTALL.NLM maintains the printing environment (print servers, print queues, printers, and print jobs). The "Same-Server Migration" requires you to recreate your printing environment after the upgrade.

The Same-Server Migration should be performed only by network supervisors who want to maintain their existing NetWare 2.1*x* or 3.1*x* server hardware as servers, and whose server disk limitations (nonexisting or insufficient DOS partition, or insufficient volume SYS:) prevent them from using INSTALL.NLM.

How It Works

Same-Server Migration updates a server installed on the same hardware as the old server, allowing you to change your NetWare 2, NetWare 3, or another network operating system into a NetWare 4.11 server.

Same-Server Migration allows you to use only one server. For this reason, there is some risk to the data involved during the conversion process to NetWare 4.11.

When you use Same-Server Migration, you must back up your data files, and then restore them to the NetWare 4.11 server after you install NetWare 4.11.

For a graphical look at how the Same-Server Migration works, see Figure 1-4 on page 6.

Two Computers Needed

Two computers are needed to upgrade using Same-Server Migration:

- A NetWare server running NetWare 2, NetWare 3, or another network operating system. This is called the *server*.
- A DOS workstation with NetWare Client™ software loaded. This is called the *client workstation*. MIGRATE.EXE runs on this client workstation.

Conceptual Understanding Needed

There are a number of concepts that you should understand before you migrate from a NetWare 2 or 3 operating system to NetWare 4.11 using MIGRATE.EXE. These concepts include a basic understanding of how MIGRATE.EXE works with:

- Bindery Services
- NetWare Directory Services (NDS)
- Migrating Directories

- Migrating Files
- User Login Scripts and MAIL Directories
- System Login Scripts
- Migrating Users
- NetWare 2 Rights Attributes (if applicable)
- Migrating Passwords

These concepts are discussed in the order listed above in Chapter 3, "Upgrade Using "Across-the-Wire" Option of MIGRATE.EXE," beginning with "Bindery Services Connection Necessary" on page 78.

Preparing for Migration

During the migration process, you set up your migration on a configuration form. This configuration form focuses on the following two areas:

- Preparing the server
- Preparing the client workstation

Preparing the Server

Prerequisites

❑ Back up your server.

Use your regular backup utility to back up your current NetWare 2.*x* or 3.*x* server or LAN Server at least twice to ensure a good copy.

The NetWare server installation procedure destroys *all* data on your hard disk. Back up the server. You do not need to restore trustees or bindery information using your backup. MIGRATE.EXE converts the trustees and bindery information to NetWare 4.11 format, accessible through bindery services.

❑ Remove unnecessary files.

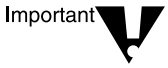
Decide if you want to migrate .BAK or .LST files, or any other temporary files. You might want to consolidate some files and directories.

Value-Added Processes (VAPs) that are in a directory that you migrate are copied to the NetWare 4.11 server; however, VAPs are not compatible with NetWare 4.11, so you should delete them before you start the migration.

❑ Prepare for long name file support (such as Macintosh, OS/2, and NFS)

❑ Rename DOS files and directories that have long names.

NetWare 2.2 and earlier lets you give directories and files 14-character names. NetWare 4.11 allows only DOS naming conventions for DOS directories. DOS limits directory names to 8 characters with a 3-character extension. (Macintosh, OS/2, and NFS files can still follow their respective naming conventions.)



Only directories and files that conform to DOS naming conventions (8.3) are migrated.

User login scripts are migrated from SYS:MAIL to the user's new mail directory on the NetWare 4.11 server.

Other files left in the mail directories are not copied to the destination mail directory and can be restored from the backup device.

❑ Obtain NLMs to replace any third-party VAPs that are currently running on the 2.x server.

❑ Run BINDFIX on the NetWare server.

BINDFIX can delete mail subdirectories and trustee rights of all users who no longer exist on the server.

❑ (Conditional) When running interoperably between NetWare and LAN Server or LAN Manager, use NETX.COM.

Preparing the Client Workstation

Prerequisites

- ❑ Make sure your DOS workstation has at least 640 KB of memory (with 480 KB of free memory) and 5 MB of free disk space on either a hard disk or another network drive that can attach to both the source server and NetWare 4.11 server.
- ❑ Make sure that your network connection is a bindery connection.

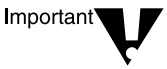
  If you are authenticated to the NetWare 4.11 server, you must log in with a bindery connection or log out and use MIGRATE.EXE to log in.
- ❑ Make sure the CONFIG.SYS file includes the following line:

  ```
  files=20
  ```

  If you add the line to the CONFIG.SYS file, save the file and then reboot the workstation.
- ❑ Make sure the NET.CFG file includes the following lines:

  ```
  Protocol IPXODI
    IPX retry count=60
  ```
- ❑ Load your LAN drivers on the DOS workstation and run the NetWare Client for DOS and MS Windows software.

Running MIGRATE.EXE



The server must meet the minimum requirements specified under “Preparing the Server” on page 105.

Same-Server Migration involves three phases, namely, migrating from the NetWare 2 or 3 server, installing the NetWare 4.11 server and restoring data files, and migrating the NetWare 2 or 3 bindery back to the server.

Procedure

1. Access the MIGRATE directory using one of the options below.

If	Then
Your client workstation has a CD-ROM device	Use the NetWare 4.11 *Operating System* CD-ROM and change to the MIGRATE subdirectory.
Your network includes a NetWare 4.11 server that had a MIGRATE subdirectory created during installation	Map a drive to the server's volume SYS: and go to the MIGRATE subdirectory.
Your client workstation does not have a CD-ROM device, nor access to a NetWare 4.11 server with a MIGRATE subdirectory	Create migration diskettes at the server using INSTALL.NLM. Use the migration diskettes to create a MIGRATE subdirectory on the client workstation.

2. From the client workstation, start the migration utility by typing

`MIGRATE` <Enter>

The "Select the Type of Migration" menu appears.

3. From the "Select the Type of Migration" menu, choose "Same-Server Migration" and press <Enter>**.**

Same-Server Migration allows you to stop the utility after you migrate the bindery information to the working directory so that you can install NetWare 4.11.

4. From the "Select the Source LAN Type" menu, choose a source LAN type (NetWare 2.*x* or 3.*x* or LAN Server, PCLP or LAN Manager) and press <Enter>**.**

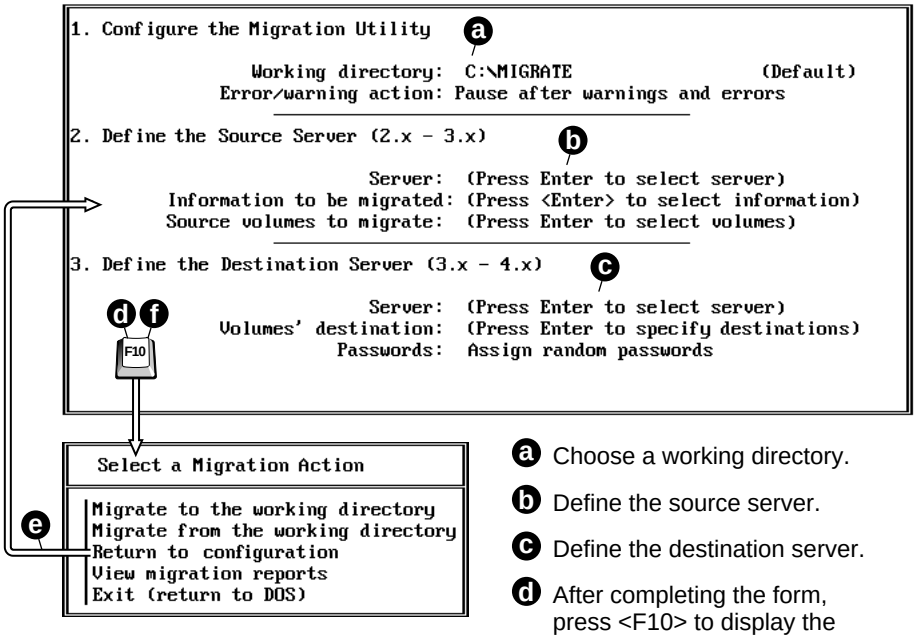
5. **From the "Select the Destination LAN Type" menu, choose a destination LAN type (4.x) and press** <Enter>**.**

Once you have selected a source and destination, MIGRATE.EXE verifies that you selected compatible versions for the migration.

The "Same-Server Migration Configuration Form" appears.

"The Same-Server Migration Configuration Form" on page 109 illustrates the process of filling out the configuration form used with MIGRATE.EXE. The corresponding migration steps are noted where applicable.

Figure 5-1
The Same-Server Migration Configuration Form



a Choose a working directory.

b Define the source server.

c Define the destination server.

d After completing the form, press <F10> to display the "Select a Migration Action" menu.

e If any changes are necessary, choose "Return to Configuration" from the menu.

f After changes are made, press <F10>. Choose an action and press <Enter>.

6. **Under Step 1, "Configure the Migration Utility," on the configuration form, press the Down-arrow key to accept the default working directory or press** <Enter> **to specify another working directory.**

   The working directory is where the bindery information and the migration reports are stored.

   Usually, the working directory is located on the hard disk drive of the workstation, but you can also put it on a network drive. You need 5 MB free disk space in this directory.

   If you are using a network drive instead of a hard drive, you must have Create, Read, Write, and File Scan rights in this directory.

   If this directory doesn't exist, MIGRATE.EXE creates it for you on your hard disk.

   Follow the Quick Help to specify a different working directory.

7. **Under Step 1 on the configuration form, press** <Enter> **to select an error/warning action.**

Error/Warning Action	Description
Pause after warnings and errors	Choose this option if you want the utility to stop after each warning and error and prompt you to continue with the migration. Each time an error is reported and you are prompted, you can choose to discontinue the prompting.
Do not pause after warnings and errors	Choose this option if you do not want to be prompted after each warning and error.

All errors are listed in the report file regardless of the option you select.

8. **Under Step 2, "Define the source server," on the configuration form, press** <Enter> **to display a list of source servers.**

9. **Choose the server that you want to migrate and press** <Enter>**.**

This selection must match the type you specified in Step 4 on page 108 of this procedure.

If the server you want to select is not shown, press <Ins> to see a list of available servers that you can log in to.

10. **Under Step 2 on the configuration form, press** <Enter> **to display categories of information you want to migrate.**

11. **Using** <F5>**, mark the information you want to migrate and then press** <Enter>**.**

    Follow the Quick Help for details on how to choose information.

    Mark as many of the categories as necessary.

If you select “All Information,” all categories are migrated.

12. **Under Step 2 on the configuration form, press** <Enter> **again to display a list of source volumes on the server that you want to migrate data from.**

13. **Mark the volumes using <**F5>**, and then press** <Enter>**.**

    Mark source volumes to migrate only if you are migrating information contained on those volumes.

    If you are migrating one or more of the following categories, you do not need to choose a source volume:

    Accounting Information
    Default Account Restrictions
    Groups
    Print Queues and Print Servers
    User Restrictions
    Users

    You must choose a source volume (or a source drive in LAN Server or LAN Manager) to migrate if you choose any of the following categories to migrate:

    All Information
    Trustee Assignments

14. **Review the fields on the configuration form and make any necessary changes.**

You cannot complete the information for the NetWare 4.11 server, since it does not yet exist.

After you migrate the source information to your working directory and install NetWare 4.11 on your server, you return to the migration utility and complete the NetWare 4.11 server information.

15. **To proceed with the migration, press** <F10> **to display the "Select a Migration Action" menu.**

16. **Choose "Migrate to the Working Directory," and then press** <Enter>**.**

    All information about the migration is scrolled to the screen and entered into a report file, which you can review later.

    This copies the bindery and trustee information to the working directory.

17. **(Conditional) If errors occur during the migration and you chose to be prompted after errors and warnings, you receive the following error message and must answer the question.**

    ```
    A migration error has occurred and is displayed
    in the migration log above. Do you want to
    continue with the migration?
    (Y=Yes/N=No/I=Ignore Error):
    ```

    Use the following table to help you answer the question.

If you choose	Then
Yes	The migration continues. The error is written to the report file, and you are prompted again the next time an error occurs.

If you choose	Then
No	The migration stops. The error is written to the report file. You receive this message: Migration from the server to the working directory is complete. Press <Enter> to continue. Press <Enter> to return to the "Select a Migration Action" menu. From there, press <Esc> to edit the fields or choose "Exit" to leave the utility and return to the DOS prompt.
Ignore	The migration continues. The error is written to the report file. You are no longer prompted when an error occurs, but all errors are written to the report file.

See *System Messages* for explanations of all error messages.

When the migration to the working directory is complete, the following message appears:

```
Migration from the working directory is complete.
Press <Enter> to continue.
```

18. (Optional) To view the migration report, choose "View Migration Reports" from the "Select a Migration Action" menu and continue with Step 19a.

18a. Choose the report for the migration you completed and press <Enter>**.**

The reports reside in the working directory that you specified earlier.

Use the report to help you complete and customize definitions, attributes, and access privileges on the NetWare 4.11 server. If you find errors on your NetWare 4.11 server after the migration, locate them in the migration report file and determine what actions to take on the NetWare 4.11 server to correct the errors.

The report file is an ASCII text file that consists of the following:

- Summary information of the bindery import phase (migrating bindery data from the server to the working directory)
- Listing of each item in each category that was read from the server
- The number of errors that occurred during the migration

18b. To exit the report, press <Esc> **once.**

18c. To return to the "Select a Migration Action" menu, press <Esc> **again.**

19. To exit the utility, choose "Exit (return to DOS)."

20. Continue with "Installing the NetWare 4.11 Server and Restoring Data Files."

Installing the NetWare 4.11 Server and Restoring Data Files

In this process, you install NetWare 4.11 on your former NetWare 2 or 3 server, and then restore the backed up data to the new NetWare 4.11 server.

Prerequisites

Checklist

❑ Prepare the server by making sure the server meets the following minimum requirements:

- 386 processor
- 16 MB of RAM
- 15 MB DOS partition
- 120 MB hard disk space

Procedure

Procedure

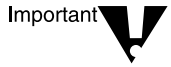
1. Install NetWare 4.11 on your NetWare 2.*x* or 3.*x* server or on your LAN Server, PCLP, or LAN Manager server.

For procedures, refer to *Installation*.

2. **(Conditional) Add name space support to any volumes that need to store files with long names.**

3. **Restore the data files from your backup device to the new NetWare 4.11 server.**

   Make a note of where you restore the data files so that you can direct the bindery information to the correct location.



Do not restore any trustees or bindery information; restore data files only.

4. **Continue with "Migrating the NetWare 2 or 3 Bindery Back to the Server."**

Migrating the NetWare 2 or 3 Bindery Back to the Server

This process involves running MIGRATE.EXE to migrate the NetWare 2 or 3 bindery to the new NetWare 4.11 server.

Procedure

1. **Restart MIGRATE.EXE by moving to the directory where the migration files are on the workstation and typing**

   `MIGRATE` <Enter>

   The "Select the Type of Migration" menu appears.

2. **Make sure that the working directory is the same one you used when you migrated from the server to the working directory.**

3. **From the "Select the Type of Migration" menu, choose "Same-Server Migration" and press** <Enter>**.**

4. **From the "Select the Source LAN Type" menu, choose a source LAN type (NetWare 2.*x* or 3.*x* or LAN Server, PCLP or LAN Manager) and press** <Enter>**.**

   This should be the same source LAN type you chose in Step 4 on page 108.

5. **From the "Select the Destination LAN Type" menu, choose a destination LAN type (NetWare 4.11) and press** <Enter>**.**

This should be the same destination LAN type you chose in Step 5 on page 109.

6. **(Optional) Change the "Error/Warning" prompt if you want.**

7. **Move the cursor to Step 3 on the configuration form and complete the destination information to move the bindery information in the working directory to the new NetWare 4.11 server.**

Do not change the source server information on the configuration form.

8. **Under Step 3 on the configuration form, press** <Enter> **to display a list of destination NetWare 4.11 servers.**

9. **Choose the NetWare 4.11 server that you want to migrate the server information to and press** <Enter>**.**

   Choose the NetWare 4.11 server you just installed or press <Ins> to log in to that server.

10. **Press** <Enter> **to display a list of selected source volumes and their default destination volumes.**

    Destination volumes that match the source volumes are displayed as the default.

11. **Select a volume and press** <Enter> **to specify the destination volume and optional directory on the NetWare 4.11 server.**

    Press <Ins> to see a list of available volumes and directories on the NetWare 4.11 server.

    If you specify a directory that does not exist on the NetWare 4.11 server, you are prompted to create it. Volumes must already be created before you can migrate them.

12. **Press** <Enter> **when you have completed the destination path of the source volume.**

13. **Continue to specify destination paths if you have multiple source volumes.**

14. **Press** <F10> **when you are finished filling out the "Volumes' destination" field.**

15. **(Optional) Under Step 3 on the configuration form, press** <Enter> **and choose a password option.**

If a password is required and the length of the password is zero (0), the migration utility assigns the destination default password length.

See the following table for a description of the options.

Password Option	Description
Assign random passwords (Default)	A password for each username that has a password on the source is generated randomly and stored in a file (NEW.PWD) in SYS:SYSTEM on the NetWare 4.11 server. **Note:** New passwords are given only to users and print servers that had a password on the server. Only users with rights to SYS:SYSTEM have access to this file. Users cannot log in until they are given their passwords from this list.
Assign no passwords	After you finish the migration, all users can log in using their previous usernames. They are not prompted for passwords. Users have the option to create their passwords if no password was chosen upon migration. **Note:** If the user account restrictions require users to have a password, they are prompted to type a new password, which the system verifies.

16. **Review the fields on the configuration form and make any necessary changes.**

Do not change the information in the source server area.

17. **To proceed with the migration, press** <F10> **to display the "Select a Migration Action" menu.**

18. **Choose "Migrate from Working Directory" and press** <Enter>**.**

All information about the migration scrolls to the screen and goes into a report file, which you can review later.

When the migration from the working directory is complete, MIGRATE.EXE notifies you.

19. (Conditional) If errors occur during the migration, and you chose to be prompted after errors and warnings, you receive the following error message and must answer the question:

```
A migration error has occurred and is displayed
in the migration log above. Do you want to
continue with the migration?
(Y=Yes/N=No/I=Ignore Error):
```

If you choose	Then
Yes	The migration continues. The error is written to the report file, and you are prompted again the next time an error occurs.
No	The migration stops. The error is written to the report file. You receive this message: Migration from the working directory to the NetWare 4.11 server is complete. Press <Enter> to continue. Press <Enter> to return to the "Select Migration Action" menu. From there, press <Esc> to edit the fields or choose "Exit" to leave the utility and return to the DOS prompt.
Ignore	The migration continues. The error is written to the report file. You are no longer prompted when an error occurs, but all errors are written to the report file.

Suggestion

See *System Messages* for explanations of all error messages.

When the migration is complete, the following message appears:

```
Migration from the working directory to the
destination server is complete. Press <Enter> to
continue.
```

20. **(Optional) To view the migration report, choose "View Migration Reports" and continue with Step 20a.**

    20a. **Select the report for the migration you completed and press** <Enter>**.**

    The reports reside in the working directory that you specified earlier.

    Use the report to help you complete and customize definitions, attributes, and access privileges on the NetWare 4.11 server. If you find errors on your NetWare 4.11 server after the migration, review the migration report to see if you can find where they occurred.

    The report file is an ASCII text file that consists of the following:

    - Summary information of the bindery import phase (migrating bindery data from the server to the working directory).
    - Summary information of the bindery export phase (migrating bindery data from the working directory to the NetWare 4.11 server).
    - Listing of each item in each category that was read from the server.
    - Listing of each item in each category that was written to or created on the NetWare 4.11 server.
    - The number of errors that occurred during the migration.

    20b. **To exit the report, press** <Esc> **once.**

    20c. **To return to the "Select a Migration Action" menu, press** <Esc> **again.**

21. **To exit the MIGRATE.EXE, select "Exit (return to DOS)" and press** <Enter>**.**

What to Do after Migration

After the migration is complete, check the NetWare 4.11 server and do the following if they apply:

- Update references to the server in the user login scripts if you changed the server name.

  Although user login scripts are migrated, they are not modified, and server names and directory paths are not changed to match your new environment.

  You can use the UIMPORT utility to migrate login scripts from bindery-based NetWare to NetWare 4.11 Directory Services (NDS). UIMPORT allows you to import data from an existing database to the NDS database. The migration utility creates the following two files in SYS:SYSTEM on the NetWare 4.11 server:

  - UIMPORT.CTL
  - UIMPORT.DAT

  See Appendix E, “Importing User Data Into NDS Using UIMPORT” on page 161.

- Run third-party applications. You might have to reinstall them for them to work properly under NetWare 4.1. You might also need to enter new paths in the setup files for any third-party applications.

  Some applications might not work properly with the migration utility. The following conditions require you to reinstall the application:

  - The application has an .EXE file that did not migrate.
  - The application is path specific and you have changed the path structure during migration.

  Some DOS applications don’t work when installed on volumes that have more than 32 MB of disk space. Some of these applications can be made to work by doing the following:

  - Restrict the application’s directory on the NetWare 4.11 server with NetWare Administrator.
  - Make the directory a fake root with MAP.

- Recreate your printing environment. See *Print Services*.

- Check user restrictions and accounting charge rates to make sure your system is configured the way you want it.

- Set any new directory and file attributes.

- If you chose to assign random passwords, print the NEW.PWD file and distribute the password information to your users. The users should change their passwords immediately.

  The report, an ASCII text file, shows passwords sorted by date. If users were migrated from more than one server, the current password is the last one listed on the report.

- Delete any old Value-Added Process (VAP) files. VAPs that are in a directory that you migrate are copied to the NetWare 4.11 server, but VAPs are not compatible with NetWare 4.

- If you have menus set up, you might have to run a menu conversion program so your menus function properly under NetWare 4.11.

appendix **A**

Calculate RAM Requirements

Overview

The following appendix is modified from a *Novell® Application Notes* article published in January 1995.

If you need to calculate the memory requirements for a new server or double check the memory requirements for an existing server, here is a convenient worksheet with updated calculations for server configurations.

Memory Calculation

Because it is important that you have accurate server memory calculations, we've examined NetWare® server memory requirements and created the attached worksheet. This new worksheet

- Replaces the versions of the calculation found in earlier NetWare 3™ and NetWare 4™ documentation
- Satisfies the memory requirements for both NetWare 3 and 4 server configurations
- Simplifies the process by using a single unit of measure
- Adds precision to the disk-related calculations by breaking out the file cache requirements into a separate calculation

The old calculations, which tagged file cache requirements onto the disk calculation, produced incorrect results as server disk capacities soared above 2 GB.

In the new worksheet, we've corrected the disk-related calculation and now allow you to figure your file cache requirement based on your total

number of clients. This is the correct way to figure file cache requirements.

Memory in NetWare 3 and 4

Only three differences between the NetWare 3 and 4 operating systems impact a server's memory requirement. We've built considerations for these differences into the worksheet so that memory requirements for both operating systems can be calculated on the same worksheet.

Core Operating System Requirements

The NetWare 4 operating system requires an additional 3 MB of memory. This memory supports the additional core services added to NetWare 4.

File Compression

File compression requires a static 250 KB of memory when activated.

Block Suballocation

Block suballocation requires five bytes of memory for every file managed by the server. This is an insignificant amount of memory for many systems.

The Worksheet

The attached worksheet requires you to know the following about your server:

- Total disk capacity

  This is the total number of megabytes attached to your server. Use 1024 MB for each gigabyte.

- Total *usable* disk capacity

  If your disk storage subsystem is duplexed or mirrored, this is half the total disk capacity above. Otherwise, the two numbers are equal.

- Total number of clients

This is the total number of end-users or connections that simultaneously use the server.

- Volume block size

  This is the block size used during the installation of your NetWare volumes. The accuracy of this variable is important because volumes with 4 KB blocks require 16 times the amount of memory required by volumes with 64 KB blocks.

- Estimated total number of files

  This is your estimate of the total number of files that will reside on the server. An estimate will suffice because the directory tables require only 6 bytes per file. If you're using block suballocation, this requirement increases to 11 bytes per file.

Once you've got this information, use it to calculate the server variables on the worksheet. Then run through the worksheet's ten line calculation to arrive at your server's total memory requirement.

Additional Memory Considerations

If you're building a server with Name Spaces, CD-ROM, NetWare for Macintosh, or other specialized server applications, the worksheet gives you a baseline memory requirement only. Look up the following resources and add the necessary memory at the bottom of the worksheet for an accurate total.

- Name Spaces

  See Appendix B, "Name Space Requirements," on page 127.

  Server Applications

  Memory calculations for NetWare for Macintosh, NetWare for SAA, OracleWare, and other NetWare server applications can be found in their documentation and on the Network Support Encyclopedia (NSEpro) CD-ROM.

Figure A-1

NetWare 3 and 4 Server Memory Worksheet

STEP 1 Calculate the following variables.

V1. Enter the total number of megabytes of disk connected to the server _____ MB
(For example: enter 1 for each MB, enter 1024 for each GB)

V2. Calculate the number of megabytes of useable disk space connected to the server _____ MB
(If you are mirroring or duplexing multiply V1 * 0.5, otherwise copy V1)

V3. Enter the server's volume block size (4, 8, 16, 32, or 64) _____ KB

V4. Calculate the number of disk blocks per MB (divide 1024 / V3) _____ Blocks/MB

V5. Calculate the total number of disk blocks (Multiply V2 * V4) _____ Blocks

V6. Enter the maximum number of clients (end-users) attached to the server _____ Clients
(For example: enter 24 for 24 end-users)

V7. Enter the maximum number of files that will reside on the server _____ Files

STEP 2 Calculate your individual memory requirements.

Line 1. Enter the base memory requirement for the core OS _____ KB
(enter 2048 for NetWare 3, or 5120 for NetWare 4)

Line 2. Calculate the memory requirement for the Media Manager (multiply V1 * 0.1) _____ KB

Line 3. If File Compression is enabled, enter 250, otherwise enter 0 _____ KB
(Note: This is not on a per volume basis, i.e., if you have 6 volumes, each with file compression enabled, you would enter 250, not 1500.)

Line 4. Calculate the memory requirement for directory tables _____ KB
(multiply V7 * .006, or if suballocation is enabled multiply V7 * .011)

Line 5. Calculate the memory required to cache the FAT (multiply Line V5 * .008) _____ KB

Line 6. Calculate the memory requirement for file cache using the following table. _____ KB
This calculation uses a 0.4MB file cache per client memory requirement. The decrease as the user community size increases is based on assumptions regarding increased repetitive use of shared data (temporal and spacial locality) within cache.

Less than 100 clients	V6 * 400
Between 100 and 250 clients	40,000 + ((V6 - 100) * 200)
Between 250 and 500 clients	70,000 + ((V6 - 250) * 100)
Between 500 and 1000 clients	95,000 + ((V6 - 500) * 50)

Line 7. Enter the total memory (KB) required for support NLMs. _____ KB
2,000KB is recommended for BTRIEVE(700), CLIB(500), INSTALL(600), and PSERVER(200)
For a rough estimate, figure 500 KB for each NLM you plan to load on the server.

Line 8. Enter the total memory (KB) required for other services. _____ KB
Other services include NetWare for Macintosh, NetWare for SAA, OracleWare, NetWare Management System, and so on.

STEP 3 Calculate your total memory requirement.

Line 9. Total Lines 1.. 8 for your total memory requirement (in KB) _____ KB

Line 10. Divide Line 9 by 1024 for a result in MB _____ MB
Using this result, round up to the server's nearest memory configuration. NetWare will enhance server performance by using all leftover memory for additional file cache.

appendix **B**

Name Space Requirements

Overview

The following appendix is modified from a *Novell® Application Notes* article published in January 1995.

In some cases additional name spaces require additional memory for directory cache and management. If you're installing additional name spaces on a NetWare® volume, you should follow the strategies in this appendix to size and tune your server's memory requirements. These sizing and tuning strategies resolve all of the additional memory requirements presented by name spaces.

The Directory Cache Connection

Each name space installed on a NetWare server's volumes requires support modules (NLM™ programs) and a modification to the server's directory entry tables (DET). The support modules require minimal memory for code. However, the modifications to each volume's DET require additional server memory for directory caching if the server's directory usage patterns are heavy and match several criteria.

With or without name spaces, all file and directory operations are handled through a single directory cache allocated and managed by NetWare. The purpose of the directory cache is to hold onto DET blocks recently read from the disk in anticipation of repeated use.

In NetWare 2, Novell cached the entire DET, but with the growth of disk capacities, fully cached directories became unrealistic for many servers. For example, a DOS file system containing 500,000 files requires 65 MB just to cache the DET. NetWare 3™ and NetWare 4™ use a most-recently-used (MRU) cache policy to manage their directory caches. The MRU policy keeps only the most recently used DET blocks in cache, tossing least-recently-used (LRU) blocks out when new DET blocks are

requested. The MRU policy is an efficient means of using a much smaller cache to provide access to a very large data structure.

NetWare also uses an auto-adjusting mechanism to manage the size of the directory cache based on specific directory usage patterns.

DET Ratios

When a name space is installed on a volume, the volume's DET is extended to include an additional directory entry for each file. For instance, on a volume supporting DOS, NFS, and HPFS, NetWare manages three directory entries for each file, one entry for each installed name space, including DOS.

During file creation and other directory-related file operations, multiple name space directory entries for each file remain contiguous and are located in the same DET block on disk and in cache. This contiguous relationship overcomes the scenario in which the entries are non-contiguous, forcing multiple DET blocks to be read to have access to all DET references to the same file.

Under NetWare's native DOS support, each block read into cache contains 32 entries that provide information linked to 32 files. This means that you have access to the directory information for 32 files without having to read another DET block from the disk. This ratio of files represented per DET block is important because additional name spaces alter it significantly.

Cache Memory Requirements

You need additional memory when you begin to cache the DET after adding one or more name spaces to one or more volumes on the server. When NetWare clients access a volume with additional name spaces, their access can be slowed because information stored in one directory cache buffer no longer represents 32 files. It represents 16, 10, or 8 files per DET block, depending on the number of name spaces configured on that volume.

For example, if you load a Macintosh name space on top of the native DOS name space, DOS and Macintosh clients have to traverse ten directory blocks to perform the same work that before required only the

traversal of five. The addition of the Macintosh name space doesn't change the directory entry block's ability to hold 32 entries, but now with two entries per file (one for each name space), the same directory entry block represents only 16 files. If you add another name space, the result is three entries per file, for a total of 10 files represented per DET block. Add an additional name space for four entries per file, and you have only eight files represented in each DET block.

The efficiency of your directory cache is decreased by a factor equal to the number of name spaces you have installed.

Sizing Server Memory

To calculate your baseline server memory requirement, use the worksheet in Appendix A, "Calculate RAM Requirements," on page 123. In addition to this baseline memory requirement, additional name spaces require six bytes of memory for each directory entry.

Using the variables at the beginning of the worksheet, multiply (V7 * .006) * the number of additional name spaces installed on the server. (V7 is the maximum number of files that will reside on the server.) If the additional name spaces are installed on specific volumes, this calculation need be performed only for the maximum number of files on the affected volumes.

Three Tuning Strategies

As with the tuning of any NetWare parameter, sizing the directory cache depends largely on the characteristics of the workload the server will be servicing—in this case, the directory access patterns exhibited by the server's user community. The key is the frequency and breadth of directory searches, file opens, closes, and creations. A low-use scenario could involve any number of users in which a small number of directories are shared or in which each users' activity remains within a small region of the directory. A high-use scenario could also involve any number of users, but user activity spans a very large number of directories and files.

Strategy 1: Handling Low Usage

At the low end, you won't need to allocate any more cache than NetWare's directory caching defaults permit. NetWare's defaults allow NetWare to allocate 20 buffers immediately upon request, followed by a maximum allocation of up to 512 directory cache buffers (2MB). This allocation is sufficient for the majority of NetWare servers.

Strategy 2: Handling Very High Usage

For the high end, you can adjust NetWare's auto-tuning facility, allowing it to allocate up to 8 MB of memory for directory cache immediately upon request, followed by a maximum allocation of up to 16 MB of total directory cache memory. These settings allow NetWare to cache up to 4096 directory cache blocks. To do this, place the SET parameters listed below in your server's AUTOEXEC.NCF file.

```
SET maximum directory cache buffers = 4000
SET minimum directory cache buffers = 2000
```

Strategy 3: Tuning the Cache

If neither strategy 1 or 2 matches your circumstances, use this strategy to tune your directory cache.

First, allow your server to operate in its production environment for several weeks. This allows NetWare's auto-tuning facility to allocate the appropriate number of directory cache buffers.

Next, use MONITOR.NLM to inspect the number of allocated directory cache buffers. This number is found in the "Directory cache buffers" value in the "General Information" screen and is used in the table below. Multiply this value by the total number of name spaces (including native DOS support) to arrive at a new buffer allocation.

For	Do
Native DOS support	Nothing.
Native DOS support plus one additional name space	Multiply the directory cache buffer by 2.

For	Do
Native DOS support plus two additional name spaces	Multiply the directory cache buffer by 3.
Native DOS support plus three additional name spaces	Multiply the directory cache buffer by 4.
Native DOS Support plus four additional name spaces	Multiply the directory cache buffer by 5.

Use the resulting buffer allocation to set the new minimum for the server, as shown in the SET parameters below. After setting the minimum, set the maximum to at least 100 buffers above the minimum, allowing the directory cache some room to grow under peak workloads.

```
SET minimum directory cache buffers =
NewBufferAllocation
SET maximum directory cache buffer =
  NewBufferAllocationCeiling
```

These new settings allow NetWare to freely allocate new directory cache buffers in a multi-name space environment, and increase the likelihood that (1) repeatedly used directory cache buffers remain in cache, and (2) those buffers remain in cache longer. The resulting directory cache is designed to support systems that house additional name spaces with the best possible read-path response times.

If, with these changes and a settling-in period, the server doesn't perform the anticipated allocation, then you know that your user community's directory access patterns don't require the additional cache. If, on the other hand, your server uses all the cache you made available, it's possible that your user community's directory access patterns are larger than you anticipated.

Based on your knowledge of the end-users' application and response time requirements, the server's allocation of directory cache might suggest the addition of more directory cache resources. The price, after all, is low: each additional 100 cache buffers add 3,200 directory entries to cache in exchange for 0.4 MB of server memory.

Just remember that any memory given to the directory cache is taken from the server's file cache. If you continue to take memory from file

cache for directory cache, you might need to add memory to your server after sizing the directory cache appropriately.

appendix **C**

NetWare 4 File and Directory Attributes

Introduction

This appendix describes the file and directory attributes unique to NetWare® 4™.

NetWare 4 with NetWare Directory Services™ has unique file and directory attributes than NetWare 2 and NetWare 3™. This appendix discusses new attributes available with NetWare 4.

For additional information, see "Rights" and "Security" in *Concepts*.

Object Rights

Object rights apply to NDS objects, but do not affect the properties of the object.

As in the file system, trustees inherit the same rights to an object that they had to the object's parent in the Directory tree, unless some of those rights are blocked by the Inherited Rights Filter.

The following table describes the NetWare 4 object rights.

Table C-1
NetWare 4 Object Rights

Object right	Description
Supervisor	Gives a trustee all rights to the object and all its properties. The Inherited Rights Filter, however, can block the Supervisor right under certain conditions.

Table C-1
NetWare 4 Object Rights

Object right	Description
Browse	Allows a trustee to see the object in the Directory tree. When a trustee makes a search which matches the object, the name of the object is returned.
Create	Allows a trustee to create a new object below this object in the Directory tree. This right only applies to container objects.
Delete	Allows a trustee to delete the object from the Directory tree. However, a trustee cannot delete an object with subordinates before deleting the subordinates.
Rename	Allows a trustee to change the name of the object.

Property Rights

Property rights apply to the properties of a NetWare Directory Services object. Rights can be assigned to each property, or a default set can apply to all properties of an object when other specific property rights are not set.

The following table describes the NetWare 4 property rights.

Table C-2
NetWare 4 Property Rights

Property right	Description
Supervisor	Gives a trustee all rights to the property. The Inherited Rights Filter, however, can block the Supervisor right.
Compare	Allows a trustee to compare any value to an existing value of the property. The comparison can return True or False, but not give the value of the property.

Table C-2
NetWare 4 Property Rights

Property right	Description
Read	Allows a trustee to read the values of the property. This right includes the Compare right.
Write	Allows a trustee to add, change, or remove any values of the property. The Write right includes the Add or Delete Self right.
Add [or Delete] Self	Allows a trustee to add or remove itself as a value of the property, but not to change any other values of the property. Only valid for properties that take object names as values.

Migrating Directory and File Rights

In NetWare 4, rights are granted for a specific directory, file, or object by trustee assignments. A user with a trustee assignment to a file, directory, or object is a trustee of that directory, file, or object.

The following table shows the directory and file rights for NetWare versions 2.1*x*, 2.2, 3.1*x*, and 4. There is no change in directory and file rights from NetWare 3.1*x* to NetWare 4.

Table C-3
Evolution of Directory and File Rights

Right	Description	Changes in NetWare 4
Supervisory (3.11)	Grants all rights to the directory, its files, and its subdirectories. **Note:** Do not confuse with Supervisor object right in NetWare 4, which grants all rights to an object, but can be masked with the Inherited Rights Filter.	Name change to Supervisor.

Table C-3 *continued*

Evolution of Directory and File Rights

Right	Description	Changes in NetWare 4
Create (all versions) [directories and files]	Assigned only if Open was also assigned.	Create now allows users to create subdirectories without the need for the Access Control (was Parental) right.
Delete (2.1*x*-2.15) [directories and files] Erase (2.2/3.11)	Deletes directories and files.	Same as 3.11 Erase.
Modify (2.1*x*-2.15) [file only] Modify (2.2/3.11) [directories and files]	Renames files or changes their attributes.	Access Control (was Parental) is no longer required to rename directories and files or attributes. Same as 3.11 Modify.
Open (2.1*x*-2.15) [directories and files]	Opens directories and files.	Open privileges are included with the Read, Write, and Create rights. (Not assigned because Open is no longer a separate right.)
Parental 2.1*x*-2.15 [directories and files] Access Control (2.2 and 3.11)	The trustee assignments and Inherited Rights Filters control how other objects can access the object.	All rights assigned to users with Access Control can be revoked at the subdirectory and file level. This right no longer assigns the right to create or rename subdirectories.
Read and Open (2.1*x*) [file only]	Reads and scans files.	A separate Open right is no longer required.
Search (2.1*x*) [directories and files]	Searches directories and files.	
File Scan (2.2 and 3.11) [directories and files]	Scans directories and files.	File Scan includes the right to search to the root of a directory. File Scan is assigned automatically when any of the NetWare rights is assigned.

Table C-3 *continued*
Evolution of Directory and File Rights

Right	Description	Changes in NetWare 4
Write and Open (2.1*x*) [file only] Write (2.2 and 3.11) [directories and files]	Allows the user to write to files.	A separate Open right is no longer required; Write is sufficient.

Migrating File Attributes

NetWare 4 reads the attributes that you set (for example, to compress or back up a file) and sets other attributes to tell you what has been done (for example, that a file has been compressed or migrated).

The following table describes file attributes for NetWare versions 2.1*x* / 2.2, 3.1*x*, and 4.

For additional information, see "Attributes" and "Security" in *Concepts*.

Table C-4
Evolution of File Attributes

Attribute	Description	Changes in NetWare 4
Can't Compress [Cc] (4)	A status flag set by NetWare. Indicates that the file cannot be compressed because of limited space savings. This attribute is shown on attribute lists, but cannot be set by the user.	New
Compressed [Co] (4)	A status flag set by NetWare. Indicates that the file is compressed. This attribute is shown on attribute lists, but cannot be set by the user.	New

Table C-4
Evolution of File Attributes

Attribute	Description	Changes in NetWare 4
Copy Inhibit (3.11)	Valid only on Macintosh workstations.	None
Delete Inhibit (3.11)	Restricts deletion of files.	None
Don't Compress [Dc] (4)	Marks the file so that it is never compressed.	New
Don't Migrate [Dm] (4)	Marks the file so that it is never migrated to a secondary storage device (like a tape drive or optical disk).	New
Execute Only (2.1*x*-2.2)	Prevents copying or backing up .EXE or .COM files.	Not available
Hidden (2.1*x*-2.2 and 3.11)	Hides files from DOS DIR scans and prevents them from being deleted or copied.	No change
Immediate Compress [Ic] (4)	Marks the file so that it is compressed on disk as soon as the operating system is able to do so, without waiting for a specific event to occur (such as a time delay).	New
Indexed (2.1*x*-2.2 and 3.11)	Occurs automatically to files that have over 64 disk blocks. Large files don't need to be flagged by the user to be indexed. Cannot be set by the user.	This is now a status flag

Table C-4
Evolution of File Attributes

Attribute	Description	Changes in NetWare 4
Migrated [M] (4)	Is a status flag set by NetWare. Indicates that the file is migrated. This attribute is shown on attribute lists, but cannot be set by the user.	New
Modified Since Last Backup (2.1*x*)Archive Needed (2.2/3.11)	Lists files modified since last backup. Assigned automatically.	Same as 3.11 Archive Needed
Purge (3.11 and later)	Purges files marked for deletion.	No change
Rename Inhibit (3.11 and later)	Prevents users from renaming files.	No change
Shareable (All)	Allows several users to access a file simultaneously.	No change
Non-Shareable (All)	Restricts multiple-user access to files.	In 3.11 and 4 no character is displayed to indicate the file is non-shareable
Read Only (All)	Restricts file modification.	No change
Read Write (All)	Indicates a file can be modified.	In 3.11 and 4 this attribute is toggled on automatically when the Read Only attribute is not set

Table C-4
Evolution of File Attributes

Attribute	Description	Changes in NetWare 4
System (All)	Assigned to system files. Hides these files from DOS DIR scans and prevents them from being deleted or copied.	No change
Transactional (All)	Activates the Transaction Tracking System™ (TTS). Prevents data corruption by ensuring all changes are made to files being modified or none are.	No change

Migrating Directory Attributes

No directory attributes were available in NetWare versions 2.0a, 2.1, 2.11, or 2.12. If you are migrating from any of these versions, set the directory attributes manually after the migration is complete.

The following table describes directory attributes for NetWare versions 2.1*x* / 2.2, 3.11, and 4. For additional information, see "Attributes" and "Security" in *Concepts*.

Table C-5
Evolution of Directory Attributes

Attribute	Description	Changes in NetWare 4
Hidden (2.1*x*-2.2 and 3.11)	Hides directories from DOS DIR scans and prevents them from being deleted or copied.	No change

Table C-5 *continued*

Evolution of Directory Attributes

Attribute	Description	Changes in NetWare 4
Immediate Compress [Ic] (4)	Marks the directory so that all files in it are compressed on disk as soon as the operating system is able to do so, without waiting for a specific event to occur (such as a time delay).	New
Don't Compress [Dc] (4)	Marks the directory so that files in it are never compressed.	New
Don't Migrate [Dm] (4)	Marks the directory so that files in it are never migrated to a secondary storage device (such as a tape drive or optical disk).	New
Private (2.1*x*-2.2)	Allows users to see the directory but not its subdirectories.	Not available. Change the trustee assignments (rights, not attributes) for the users that have access to the directories flagged Private. Grant these users only the Create right to the directory.
System (ALL)	Assigned to system directories. Hides them from DOS DIR scans and prevents them from being deleted or copied.	No change
(Normal 2.2)	Indicates no attributes have been set.	Not available

Table C-5 *continued*

Evolution of Directory Attributes

Attribute	Description	Changes in NetWare 4
Delete Inhibit (3.11)	Restricts directory deletion.	No change
Purge (3.11)	Purges directories set for deletion.	No change
Rename Inhibit (3.11)	Restricts renaming of directories.	No change

Table C-6

Bindery Objects that Are Upgraded to Directory Objects

NetWare 3.1*x* bindery object	After upgrading to NetWare 4
Group EVERYONE	CN=EVERYONE Object class=Group Members of this group have the same rights to objects (and their properties) they had rights to before the upgrade.
Other groups	CN=*group_name* Object class=Group Members of these groups have the same rights to objects (and their properties) they had before the upgrade.
User GUEST	CN=GUEST Object class=User GUEST has PUBLIC rights as defined in the tree.
User SUPERVISOR	Effective rights on the Server object are greater than or equal to the Managed right on its ACL property.
Supervisory equivalent	Has supervisory rights to the Volume object and the file system.

Table C-6 *continued*

Bindery Objects that Are Upgraded to Directory Objects

NetWare 3.1*x* bindery object	After upgrading to NetWare 4
Console operator	Becomes an Operator property of the Server object.
Workgroup manager	Has supervisor right to the User objects created in 3.*x*, the Bindery Context object, and any new objects created.
User Account Manager	Has supervisor rights to objects managed in 3.*x* (Object Supervisor property). Cannot create new objects.
Print queue operator	Becomes an Operator property of the Print Queue object.
Print queue	Becomes a Print Queue object. (Print queues get upgraded to 4.1 queues; Bindery object type=3).
Printer	Becomes a Printer object (if you run PUPGRADE.NLM to upgrade print services).
Printer definition/print job configuration	Become Directory properties in 4.1 (if you run PUPGRADE.NLM to upgrade print services).
Print server	Becomes a Print Server object (if you run PUPGRADE.NLM to upgrade print services).

Table C-7

Bindery Objects that Remain Unchanged in NetWare Directory Services

3.1*x* bindery	After upgrading to 4
Bindery queue	Represents a queue placed in the Directory tree by an upgrade or migration utility, but that NetWare Directory Services cannot identify. This object is for backward compatibility with bindery-based utilities.

Table C-7

Bindery Objects that Remain Unchanged in NetWare Directory Services

3.1*x* bindery	After upgrading to 4
Other queues	Become Bindery Queue objects to maintain the original type of queues.

appendix **D**

Upgrade Across a LAN/WAN Using RCONSOLE

Overview

The following appendix is modified from a *Novell® Application Notes* article published in May 1995.

This appendix presents a method for administrators of LAN and WAN networks to upgrade NetWare® 3.1*x* and 4.*x* servers to NetWare 4.11 from a central location using the RCONSOLE utility. This appendix guides you step-by-step through the process; however, we suggest that you use a lab environment until you are familiar with the overall concept, the general layout of the instructions, the steps involved, and the possible problems you may encounter.

Hardware Configuration Requirements

You must have the following hardware configuration before installing NetWare 4.11 using RCONSOLE:

- An existing DOS client with an installed CD-ROM drive or an attachment to a NetWare server with the NetWare 4.11 *Operating System* CD-ROM mounted as a volume.
- One or more computers (which will be referred to as "target servers") meeting all of the hardware requirements listed in the *Installation* manual. These computers must have either NetWare 4™ or NetWare 3™ installed and running.
- Each computer connected to the DOS client via a LAN or WAN.

Prerequisite Tasks

You must complete the following tasks before installing NetWare 4.11 using RCONSOLE:

- Plan your Directory tree. See Chapter 3, “Designing the Directory Tree Structure” in *Guide to NetWare 4 Networks* for guidelines and suggestions.
- If the new server has never been a server before, complete the tasks explained in Chapter 1, “Prepare to Install” in *Installation*. Then refer to Appendix F, “Install Using RCONSOLE,” in *Installation*.
- Run the new server’s Setup program and set its time to the exact local time. (The time synchronization feature in NetWare Directory Services uses the computer’s time setting.) You may need to call someone at the remote site to ensure that the server’s clock is set correctly.
- If necessary, partition and format your hard disk. Boot from the NetWare *License* diskette; type FDISK and follow the screen prompts to partition the hard disk. Reboot the machine and type FORMAT to format the DOS partition.

Your existing server must have a DOS partition of at least 15 MB. If the server’s DOS partition is smaller than 15 MB, you cannot use the RCONSOLE to upgrade your server.

Reformatting your hard disk erases all stored files. Be sure to back up your hard disk prior to partitioning and formatting.

Necessary Resources

You need the following resources:

- The NetWare 4.11 *License* diskette
- The NetWare 4.11 *Operating System* CD-ROM

- Two high-density floppy diskettes or a C: partition on the DOS workstation large enough to hold approximately 2 MB of files.
- *Installation* and *Guide to NetWare 4 Networks.*

Copy Files for the Target Server

Complete the following steps to copy the files for the target server.

Procedure

1. **Verify that the STARTUP.NCF file that is located in the server's boot directory lists the correct disk driver name that exists in NetWare 4.11.**

   This can be done by loading INSTALL.NLM on the server to be upgraded and viewing the STARTUP.NCF file.

2. **Create a new .NCF file (named REST.NCF, for example) that contains the commands listed below.**

   Use the following commands if you are upgrading a NetWare 4.x server:

   ```
   DOWN
   RESTART SERVER
   ```

   Use the following commands if you are upgrading a NetWare 3.1*x* server:

   ```
   REMOVE DOS
   DOWN
   EXIT
   ```

   This file will be copied to the server boot directory.

3. **Make a directory on the workstation to run RCONSOLE (for example, a directory called UPDATES). The files can also be copied to two floppy diskettes.**

   Type

   `MD C:\UPDATES and press` <Enter>**.**

4. **Copy the following files into the directory that you created in Step 3.**

File	Location on NetWare 4.11 CD-ROM
RSPX.NLM	\PRODUCTS\NW411_\411\BOOT
REMOTE.NLM	\PRODUCTS\NW411_\411\BOOT
NWSNUT.NLM	\PRODUCTS\NW411_\411\BOOT
INSTALL.NLM	\PRODUCTS\NW411_\411\BOOT
CLIB.NLM	\PRODUCTS\NW411_\411\BOOT
STREAMS.NLM	\PRODUCTS\NW411_\411\BOOT
ISSLIB.NLM	\PRODUCTS\NW411_\411\BOOT
DSAPI.NLM	\PRODUCTS\NW411_\411\BOOT
NLMLIB.NLM	\PRODUCTS\NW411_\411\BOOT
FPSM.NLM	\PRODUCTS\NW411_\411\BOOT
NIT.NLM	\PRODUCTS\NW411_\411\BOOT
REQUESTR.NLM	\PRODUCTS\NW411_\411\BOOT
MPDEDECT.NLM	\PRODUCTS\NW411_\411\BOOT
THREADS.NLM	\PRODUCTS\NW411_\411\BOOT
NBI.NLM	\PRODUCTS\NW411_\411\BOOT
SERVER.EXE	\PRODUCTS\NW411\IBM\411\BOOT
SERVER.MSG	\PRODUCTS\NW411\IBM\411\BOOT\NLS *language*
ICMD.NLM	\PRODUCTS\NW411_\411\BOOT
LAN Driver	\PRODUCTS\NW411\IBM\411\LANDRV
MSM.NLM	\PRODUCTS\NW411\IBM\411\LANDRV

File	Location on NetWare 4.11 CD-ROM
ETHERTSM.NLM, TOKENTSM.NLM, RXNETTSM.NLM, or FDDITSM.NLM.	\PRODUCTS\NW411\IBM\411\LANDRV
Disk Driver	\PRODUCTS\NW411\IBM\411\DISKDRV
REST.NCF (file created above for rebooting server)	File created manually

5. **(Conditional) If the NetWare 411 *Operating System* CD-ROM is mounted as a volume, attach and map a drive to the server hosting the mounted volume.**

6. **(Conditional) If you are using a CD-ROM drive attached to the workstation, make sure that the DOS drivers for the CD-ROM are loaded and functioning properly.**

7. **Make a directory on the workstation to run RCONSOLE (for example, a directory called RCONSOLE). The files can also be copied to a floppy diskette.**

   Type

   `MD C:\RCONSOLE` <ENTER>

8. **Copy the following files into the directory you created in Step 7 or onto a floppy diskette:**

File	Location on NetWare 4.11 CD-ROM
RCONSOLE.EXE	\PRODUCTS\NW411_\411\PUBLIC
TEXTUTIL.MSG	\PRODUCTS\NW411_\411\PUBLIC\NLS*language*
TEXTUTIL.IDX	\PRODUCTS\NW411_\411\PUBLIC
RCONSOLE.MSG	\PRODUCTS\NW411_\411\PUBLIC\NLS*language*
RCONSOLE.HEP	\PRODUCTS\NW411_\411\PUBLIC\NLS*language*

Configure the Target Server

Follow the procedures below to install the files on the target server, and to prepare the target server for remote installation from the DOS client.

Procedure

1. **Make sure that the LAN driver for the target server is loaded and bound.**

2. **Load RSPX.NLM on the target server by typing:**

   LOAD RSPX <Enter>

3. **Type a remote console password and press** <Enter>**.**

   This password is used by the DOS client to establish a remote connection.

Configure the DOS Client and Install the Server

Follow the procedures below to configure your DOS client to communicate with the target server and then install the NetWare 4.11 server.

Procedure

1. **At the workstation, type**

   RCONSOLE <Enter>

   The “Connection Type” menu appears.

2. **Choose the applicable connection type and press** <Enter>**.**

   For example, if you were connected to the new server via a LAN, you would select “SPX™.”

   The “Available Server” menu appears.

3. **Highlight the name of the target server and press** <Enter>**.**

   You are prompted for a password.

4. **Enter the remote console password you entered in Step 3 under "Configure the Target Server" and press** <Enter>**.**

5. **When a remote connection is made, press** <Alt><F1>**.**

   The "Available Options" menu appears.

6. **Highlight "Transfer files to Server" and press** <Enter>**.**

   The "Source Path on Workstation" screen appears.

7. **Type the path to the subdirectory that you created in Step 3 under "Copy Files for the Target Server" and press** <Enter>**.**

   The "Target Path on Server" screen appears.

8. **Type the path to where the NetWare 4.11 upgrade files are to be copied and press** <Enter>**.**

   This step copies the necessary server boot files to the target server's bootable DOS partition.

   In order for the "reboot" procedure to work, the subdirectory name used must exist on the target server's DOS partition regardless of the NetWare operating system being upgraded.

   In addition:

If	Then
You are upgrading a NetWare 3.1x server	The subdirectory name must be the name of the boot directory on the NetWare 3.1x server. For example, C:/SERVER.312.
You are upgrading a NetWare 4.x server	The subdirectory name must be the same as the NetWare 4.*x* server that is being upgraded (that is, C:\SERVER.4*x*).

   The "Copying Files from Workstation to Server" screen appears.

If you are not sure of the directory names on the server's bootable DOS partition, select "Directory Scan" from the "Available Options" menu (in Step 5) and type

C: <Enter>

A directory on the server's C: partition appears.

When the file copying is finished, the "Available Options" screen appears.

9. **Press** <Esc> **to return to the system console screen.**

10. **(Conditional) If the target server is a NetWare 3.1x server, and the server's AUTOEXEC.BAT file does not execute SERVER.EXE, place it in the AUTOEXEC.BAT file.**

    10a. **From console prompt, type**

    LOAD EDIT C:\AUTOEXEC.BAT <Enter>

    10b. **Create or edit the AUTOEXEC.BAT file so that it contains the following lines:**

    CD\SERVER.312
    SERVER

The directory that is changed to via the CD command must be the same as the directory that is already being used for the NetWare 3.1*x* server files. REMOTE.NLM cannot create subdirectories on the C: partition.

    10c. **Press** <Esc>**, choose "Yes" to exit and press** <Enter>**.**

11. **Type**

LOAD INSTALL <Enter>

The "Installation Options" menu appears.

12. **Edit the AUTOEXEC.NCF file so that the LAN driver load line looks similar to the following:**

    LOAD C:*directory**lan driver*
    LOAD C:*directory***REMOTE** *password*
    LOAD C:*directory***RSPX**
    BIND IPX to *lan driver*

    where *lan driver* is the name of the appropriate LAN driver, *directory* is the directory on the DOS partition where the NetWare 4.11 server files are located, and *password* is the password of your choice.

We strongly suggest that lines in both the STARTUP.NCF and AUTOEXEC.NCF files that reference NetWare 4.*x*/3.*x* NLMs be replaced with the NetWare 4.11 versions. References to the NetWare 4.*x*/3.*x* patches should be removed completely. References to third-party NLMs should be REMarked out until the upgrade process is complete.

13. **Press** <Esc> **to exit INSTALL.NLM.**

    An "Exit Install?" Yes / No prompt appears.

14. **Choose "Yes" and press** <Enter>**.**

    The system console prompt appears.

15. **Type the path and name of the .NCF file created in Step 2 under "Copy Files for the Target Server" (that is, C:\SERVER.4*x*\REST) and press** <Enter>**.**

    This will cause the server to down itself and restart. The RCONSOLE connection will be lost and the screen will return to the "Available Servers" menu.

16. **Give the server a few minutes to come back up and then press** <Esc>**.**

    This brings up the "Exit Remote Console" prompt.

17. **Choose "No" and press** <Enter>**. Repeat this process until the server name appears.**

18. **Highlight the name of the target server and press** <Enter>**.**

    You are prompted for a password.

19. **Enter the remote console password you entered in Step 3 under "Configure the Target Server" and press** <Enter>**.**

20. **After a remote console connection is made, change to the server's console prompt by pressing** <Alt>+<F4>**.**

21. **Load INSTALL.NLM by typing**

    LOAD C:*4.1x subdirectory***INSTALL SO <**Enter>

    where 4.1x subdirectory is the directory used in Step 8 under "Configure the DOS Client and Install the Server."

Note

Load INSTALL.NLM from the C partition subdirectory that the NetWare 4.11 files were copied to in Step 8 under "Configure the DOS Client and Install the Server," not from the mounted volume (for example, LOAD C:\SERVER.411\INSTALL).

Figure D-1
The Installation Options Menu

```
                    Installation Options

Driver options     (load/unload disk and network drivers)
Disk options       (configure/mirror/test disk partitions)
Volume options     (configure/mount/dismount volumes)
License option     (install the server license)
Copy files option  (install NetWare system files)
Directory options  (install NetWare Directory Services)
NCF files options  (create/edit server startup files)
Product options    (other optional installation items)
Server options     (install/upgrade/this server)
Exit
```

If	Go to
You are upgrading a NetWare 3.1x server	"Upgrading a 3.x Server."
You are upgrading a NetWare 4.x server	"Upgrading a 4.x Server."

Upgrading a 4.*x* Server

Complete the following steps to upgrade a NetWare 4.*x* server.

Procedure

1. **Choose "Copy files option" and press** <Enter>**.**

   A screen appears indicating the default path from which NetWare 4.11 files will be installed.

2. **(Conditional) If the source copy of the NetWare 4.11 *Operating System* CD-ROM is located on another server, press** <F3>**.**

   When the "Specify a directory path" screen appears, enter the entire path to the CD-ROM.

   For example:

   Server_Name/**NW411:PRODUCTS/NW411/INSTALL/IBM/DOS/XXX/***language*

   Enter the name of the password as prompted.

3. **(Conditional) If the NetWare 4.11 *Operating System* CD-ROM is located on the remote workstation, press** <F4>**.**

   The "Specify a directory path" screen appears.

4. **(Conditional) Enter the path to the CD-ROM drive of the DOS client.**

   For example, if the CD-ROM drive were drive D:, the path would be:

   D:PRODUCTS/NW411/INSTALL/IBM/DOS/XXX/*language* <Enter>

   where *language* denotes the language being installed.

   The "Specify a server boot path" screen appears.

5. **Enter the path used in Step 5 under "Copy Files for the Target Server."**

The “Indicate which file groups you want installed” screen appears.

6. **Select the file groups to be copied and press** <F10>**.**

   The “File Copy Status (Preliminary Copy)” screen appears. After a while, the “File Copy Status (Main Copy)” screen appears.

   Once the copying is complete, the “Installation Options” screen appears. At this point the upgrade is complete. For further instructions see “Perform Other Installation Options (Optional)” in Chapter 3 of *Installation*.

Upgrading a 3.*x* Server

Complete the following steps to upgrade a NetWare 3.*x* server.

Procedure

1. **Select “Server Options” and press** <Enter>**.**

   The “Server Installation Options” screen appears.

2. **Select “Upgrade a 3.x or 4.x Server to 4.11” and press** <Enter>**.**

   An information screen appears which, in this case, is not applicable.

3. **Press** <Enter> **to continue.**

   A screen appears indicating the default path from which NetWare 4.11 files will be installed.

4. **(Conditional) If the source copy of the NetWare 4.11 *Operating System* CD-ROM is located on another server, press** <F3>**.**

   When the “Specify a directory path” screen appears, enter the entire path to the CD-ROM. For example:

   Server_Name`/NW411:PRODUCTS/NW411/INSTALL/IBM/DOS/XXX/`*language*

   Enter the user name and password as prompted.

5. **(Conditional) If the NetWare 4.11 *Operating System* CD-ROM is located on the remote workstation, press** <F4>**.**

   The "Specify a directory path" screen appears.

6. **(Conditional) Enter the path to the CD-ROM drive of the DOS client.**

   For example, if the CD-ROM drive were drive D:, the path would be:

   D:\PRODUCTS\NW411\INSTALL\IBM\DOS\XXX*language*
   <Enter>

   where *language* denotes the language being installed.

   The "Additional Driver Action-Disk Driver" screen appears.

7. **Since the disk driver is already loaded, select "Continue Installation" and press** <Enter>**.**

   A screen may appear listing LAN drivers that were not updated. These drivers are ones that INSTALL.NLM found existing on the target server, but are not included on the NetWare 4.11 *Operating System* CD-ROM. Contact the LAN card vendor for a NetWare 4.11 version of the LAN driver.

8. **Press** <Enter> **to continue.**

   The "Select Optional NetWare Files" menu appears.

9. **Choose the file groups to be copied and press** <F10>**.**

   The "Specify a Server Boot Path (where SERVER.EXE will be)" screen appears.

10. **Enter the path used in Step 8 of "Configure the DOS Client and Install the Server" and press** <Enter>**.**

    The "File Copy Status (Preliminary Copy)" screen appears. After a while, the "Choose the Server Drivers-Network Driver" screen appears.

11. **Since the LAN driver is already loaded, select "Continue Installation" and press** <Enter>**.**

    The "License File Installation" screen appears.

12. **Press <F4> to select a remote workstation as the source.**

    The "Specify a remote workstation directory path" screen appears.

13. **Insert the NetWare 4.11 *License* diskette into drive A: on the remote workstation. Type**

    A: <Enter>

    A message appears stating the server license was successfully installed.

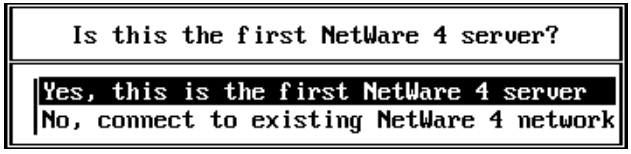
14. **Press** <Enter> **and continue with "Installing NetWare Directory Services."**

Installing NetWare Directory Services

Once the preliminary files have been copied to the server, the network is scanned for Directory trees. Unless you are installing the first NetWare 4 server in the network, you will most likely want to install the server into an existing Directory tree.

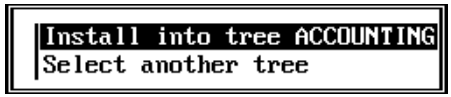
Based on your network configuration, one of the following screens appears.

Figure D-2
When No Directory Tree Is Located



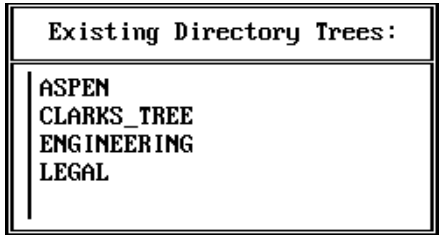
If	Go to
The menu in Figure D-2 appears	"A Nonlocatable Directory Tree, or the First 3.1x Server Upgrade" on page 27. Complete the remainder of the chapter.

Figure D-3
When a Single Directory Tree Is Located



If	Go to
The menu in Figure D-3 appears	"A Single Directory Tree Is Found" on page 36. Complete the remainder of the chapter.

Figure D-4
When Multiple Directory Trees Are Located



If	Go to
The menu in Figure D-4 appears	"Multiple Directory Trees Are Found" on page 39. Complete the remainder of the chapter.

appendix **E**

Importing User Data Into NDS Using UIMPORT

Importing User Information into the Directory Services Database

The UIMPORT utility allows you to import data from an existing database into the NetWare Directory Services™ (NDS) database. This utility is particularly valuable if you have hundreds, or thousands, of user records that you want to record in NDS without having to manually re-create each user.

Any application capable of converting records to a comma-separated ASCII file will work with UIMPORT.

You can use UIMPORT to automate the maintenance of your NDS database when you want to

- Create User objects in the NDS database using records from another database.
- Update User properties in the NDS database when records are changed in your original database program.
- Delete User objects when their accounts on the network are no longer needed.

Understanding the Import Process

The process for importing records from your database into the NDS database is as follows:

1. **Generate a data file**—a delimited ASCII text file—from your existing database records.

Most applications let you save data as a comma-separated ASCII text file with quotation marks as delimiters.

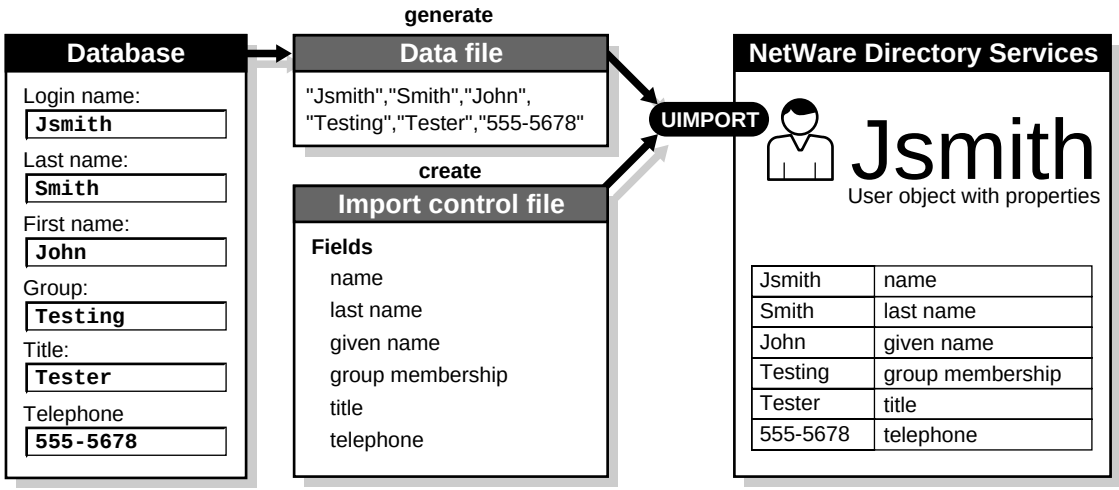
2. **Create an import control file** to interpret the data file.

   You can create the import control file using any text editor. This file defines how records in the data file are imported into NDS and which fields (properties) the data will be placed in.

3. **Create User objects** using UIMPORT to transfer data from your database to the NDS database.

The following figure provides a general overview of the import process.

Figure E-1
Import Process



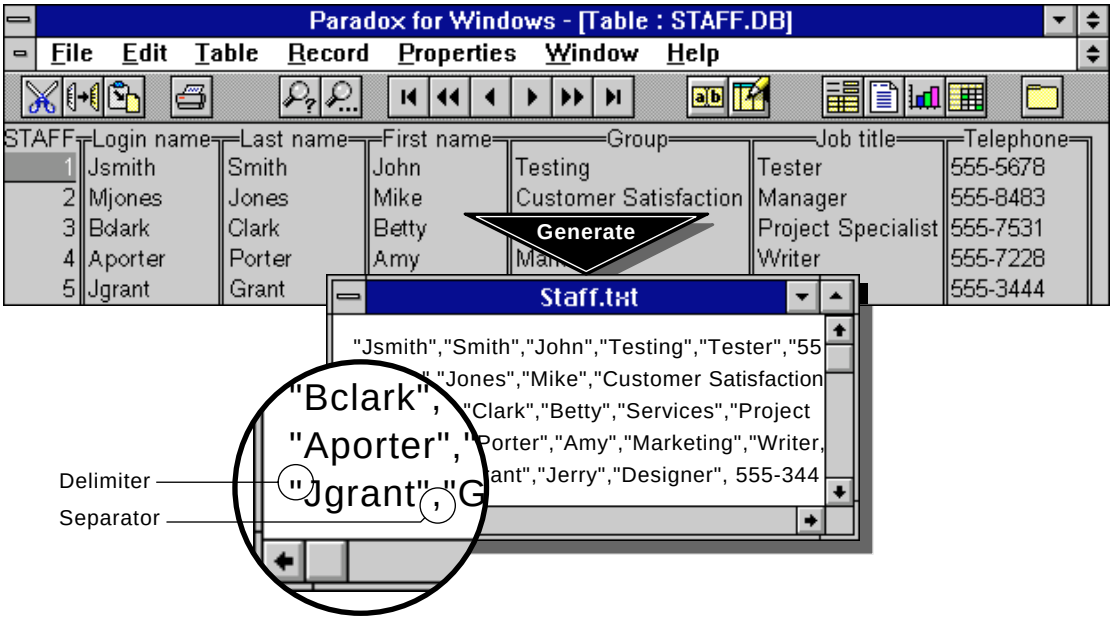
Preparing to Import User Information into the Directory Services Database

Generating the Data File

You generate a data file from within your database application, or any other application, by saving the data as a delimited ASCII text file. Most applications use commas as the default field separator and quotation marks as the default delimiter.

The following figure shows a sample database table created using Borland's Paradox® for Windows®, and the data file generated from it.

Figure E-2
Generate a Data File



If you need instructions on how to save your data as a delimited ASCII file, see the documentation accompanying your application.

Before you generate a data file from within your database application, look for embedded punctuation in the data fields.

Important

If the fields in your database have embedded punctuation (for example, quotation marks or commas), you should not use the same punctuation as field separators or delimiters when you export the data.

If you do, UIMPORT won't be able to distinguish between new fields and embedded punctuation.

Since embedded quotation marks and commas are the most commonly found punctuation in database fields, here are some guidelines to help you avoid problems in generating a data file.

They are grouped according to four situations you might encounter:

- You have both embedded quotation marks and embedded commas that you don't want to delete:

  We recommend that you export the data using an alternate character for the comma separator, and that you *not* use quotation marks as delimiters.

  For example, you could export data with carets (^) in place of comma separators. As a result, carets would separate each field in the data file you generate. You must specify in the import control file the replacement character you use. (See Table E-1 on page 168.)

  You should also export data without using quotation marks to delimit the fields. If your application uses quotation marks as the default delimiter, you must change the delimiter to an alternate character or choose to use no delimiter.

  If you use an alternate character, you must specify in the import control file the replacement character you use. (See Table E-1 on page 168.)

- You have neither embedded quotation marks nor embedded commas:

  We recommend that you export the data using commas to separate the fields.

  If your application inserts quotation marks as delimiters around each field, you can accept this default, or you can choose to use no delimiter.

- You have embedded commas, but no embedded quotation marks:

We recommend that you export the data using an alternate character for the comma separator.

For example, you could export data with carets (^) in place of comma separators. As a result, carets would separate each field in the data file you generate. You must specify in the import control file the replacement character you use. (See Table E-1 on page 168.)

If your application inserts quotation marks as delimiters around each field, you can accept this default, or you can choose to use no delimiter.

- You have embedded quotation marks, but no embedded commas:

  We recommend that you export data using commas to separate the fields and without using quotation marks to delimit the fields.

  However, if your application uses quotation marks as the default delimiter, you must change the delimiter to an alternate character or tell your application to use no delimiter.

  If you use an alternate character, you must specify in the import control file the replacement character you use. (See Table E-1 on page 168.)

One of the fields required to create new user objects in the NDS database is *name*. If you don't have a field in your database that records each individual's login name, you have a few options:

- You can create a login name field within your application (and assign each individual a unique eight-character login name) before generating the data file. This option is recommended.

- You can generate the data file and then add a unique login name field to each string of user information in the data file.

- You can use an existing field in your application to represent the login name field. For example, you may have a field of employee or ID numbers. You can generate the data file and import the unique numbers into NDS as user login names. (Keep in mind that numbers are not as easy to recognize or manage as names.)

Creating the Import Control File

You can create the import control file using any text editor.

This file controls how the information in the data file is imported into the Directory Services database, and determines which fields (called properties in NDS) the data is placed in. The import control file contains two types of information:

- **Control parameters** define characters used in the data file and specify how data is updated.
- **Field definitions** determine where data is put in the NDS database (which properties the fields are imported into).

Enter control parameters first, followed by field definitions. (Control parameters are explained in Table E-1 on page 168. Field definitions are explained in Table E-2 on page 173.) For example:

```
Import control
    Separator=^
    User template=y
Fields
    Last name
    Name
    Telephone
    Title
```

Control and field parameters are not case-sensitive, though the headings “Import Control” and “Fields” must be left aligned (you don’t have to specify import control parameters if you use the defaults). Entries under the headings must be preceded by at least one space or a tab.

To create a new user, two field definitions are required: “Name” (the user’s login name) and “Last name.” To update records for users who have already been created, only the “name” field is required. These fields are explained in Table E-2 on page 173.

All fields in the data file must have a corresponding field definition in the import control file. For a sample data file and its corresponding

import control file, see “Data File Created from Exported Database Fields” on page 184.

Although you don’t have to save the import control file in the same directory in which you saved the data file, doing so makes locating the files and running UIMPORT easier. If you don’t, you must specify the path to each of the files when you run UIMPORT.

After generating the data file and creating the import control file, see “Creating User Objects with the UIMPORT Utility” on page 187 to start the import process.

For more information about	See
Creating a comma-separated ASCII file	Your database application documentation
Creating and managing User objects	Chapter 1, “Managing Directories, Files, and Applications,” of *Supervising the Network*
Starting the import process	“Creating User Objects with the UIMPORT Utility” on page 187
NetWare Directory Services	“NetWare Directory Services” in *Concepts*, and *Guide to NetWare 4 Networks*.

Use the applicable control parameters in the following table to create the "Import control" section of the import control file. These can be changed by adding the control parameter in the data file. When doing so, add an exclamation point (!) before the control parameter in the data file. (See "Data File Edited to Update User Objects" on page 185.)

Table E-1
UIMPORT Control Parameters

Control Parameter	Explanation
Create home directory	Allows you to create a home directory for User objects. If you create a home directory, users are automatically given file system rights to work in that directory. This option *does not* work unless you set the "Home directory path" and "Home directory volume" control parameters. (Also, this option does not work if you define a data field for "Home Directory," because that field overrides Create home directory.) For example, if you want the users you are importing to have a home directory, type CREATE HOME DIRECTORY=Y. The default setting is "N", so if you don't want to create home directories, no parameter is needed. **Note:** If you don't set this parameter to Y, you can still import Home Directory values through the control section of the import control file or through the data file. These values are put into the object's Home Directory property, but the directory on the file system is not created.
Delete Mailbox Dirs	Allows you to delete the mailbox directories when moving a user's mailbox from one messaging server to another or changing the mailbox ID of a user. To delete the mailbox directories, type DELETE MAILBOX DIRS=Y. The default is "N"; so if you don't want to delete the mailbox directories, no parameter is needed.

Table E-1 *continued*

UIMPORT Control Parameters

Control Parameter	Explanation
Delete property	Allows you to delete values for a property of a User object. For example, to delete all titles from a User object's Title property, type DELETE PROPERTY=#DEL, and then edit the data file by putting "#DEL" in the Title field. If you delete a group membership, you also delete the security equals for the group. You cannot delete the following properties with the Delete property parameter: *Volume restrictions*. To delete volume restrictions, enter the volume name and a negative integer such as –1 for the restrictions. For example: VOL1:–1 *Password*. To delete the password, enter "" (a null field) for the password field. *Home directory*. You can delete the Home directory property, but the home directory path is not deleted by UIMPORT. You must manually go to this directory and delete it. There is no default for this property, so if you don't want to delete properties, no parameter is needed. For more information, see "Creating User Objects with the UIMPORT Utility" on page 187.
Home directory path	If you create a home directory for User objects, you *must* specify a path in the file system where you want the directories to be created. This and the Home directory volume must be entered as a pair. If you specify a Home directory volume, the path is assumed to be null unless this field is also specified. If you want home directories created in the Users directory, type HOME DIRECTORY PATH="USERS". Do not include the volume name in the path.

Table E-1 *continued*

UIMPORT Control Parameters

Control Parameter	Explanation
Home directory volume	If you create a home directory for User objects, you *must* specify the name and context of the Volume object associated with the file system where the home directories are created. For example, if the file specified in “Home directory path” is on volume SYS:, enter the Volume object’s complete DS name. For example: HOME DIRECTORY VOLUME=“SYS.STUDENT RECORDS.UNIVERSITY”. When creating users, the Home directory volume is set in the following order: 1. Information in the data file. If the data file has a home directory specified, its value will be used. 2. If there is no home directory specified in the data file, the home directory from the User Template object is used. This happens regardless of whether or not you select to copy the User Template properties when creating users. 3. If the home directory is not found in the data file or the User Template, this control parameter (Home directory volume) will be used.
Import mode	Controls how the User objects will be created or updated. Options are C (create new objects only), U (update data for existing objects only), B (both create and update), and R (remove objects). The default is “B”, so if you want new objects to be created *and* existing users updated, no parameter is needed. **Note:** You can use the same import control file for adding and deleting users by just changing the Import Mode to R (Remove objects). This can be especially useful if you have just created some users with incorrect information and need to restart the entire process. Just change the Import mode to R, run UIMPORT to delete the users, then change the Import Mode back to C or B and rerun UIMPORT.

Table E-1 *continued*

UIMPORT Control Parameters

Control Parameter	Explanation
Maximum directory retries	Allows you to specify how many times UIMPORT should attempt to get the object ID of the user you have just added in order to create home directories and mailbox directories. For example, type Maximum directory retries=5. If Directory Services creates your user on one server's replica and you create the home or mailbox directory on another server, the second server might not know about the user immediately. This option allows time for the network to catch up with the request to add the user on the other server. Initially this option is set to 5; but if you get the message "991: An error occurred in NWDSMapNameToID…," you should increase this number.
Name context	Specifies the Directory Services context where user objects are created. You should always use this parameter. For example, if you are in the Organization Development.ACME and you want to create user objects in a different Organizational Unit (Engineering), type NAME CONTEXT=.Engineering.ACME The default is your current context (the context displayed when you type CX from the command line).
Quote	Specifies the character used to delimit fields when exporting data to the data file. You might want to change the delimiter from quotes to different characters if your data has embedded quotation marks and you don't want to delete them. For example, if you have any embedded quotation marks in fields in your database, you could export data using carets (^) as the delimiter. You would enter QUOTE=^ as the quote parameter. The default character for delimiters are quotes (""). If you don't have embedded quotation marks in fields in your database, and you generate the data file with quote delimiters, no parameter is needed.
Replace value	Allows you to overwrite or add data to multivalue properties. For example, to import new telephone numbers to User properties without saving the existing numbers, type REPLACE VALUE=Y. The default is "N," so if you don't want data to be added to multivalued properties, no parameter is needed. You do not need to set this parameter for single-value fields, because the new value automatically overwrites the existing value.

Table E-1 *continued*

UIMPORT Control Parameters

Control Parameter	Explanation
Separator	Specifies the character used to separate fields when exporting data to the data file. If the fields in your database have embedded punctuation (such as commas), you should not use the same punctuation as field separators when you export the data to the data file. If you do, UIMPORT won't be able to distinguish between new fields and embedded punctuation. Instead, use a different character as the separator. For example, if you have any embedded commas in fields in your database, you could export the data using a semicolon (;) as the field separator. You would enter SEPARATOR=; as a control parameter. The default separator is a comma. If you have no embedded commas in fields in your database, and you generate the data file with comma separators, no parameter is needed.
User template	Specifies whether you want user template defaults to be applied to the User objects being created. (For information on user templates, see "Managing User Templates" in Chapter 1 of *Supervising the Network*. To apply template properties to User objects, type USER TEMPLATE=Y. Template properties are applied first, and then properties from the data file are imported. The default is "N", so if you do not want the user template defaults applied to the new User objects, no parameter is needed. The following fields are copied from the user Template: Account balance, Account has expiration date, Allow unlimited credit, Allow user to change password, City, Days between forced changes, Default server, Department, Description, Fax number, Foreign Email address, Foreign Email alias, Full name, Generational qualifier, Given name, Grace logins allowed, Group membership, Home directory, Language, Location, Login allowed time, Login script, Low balance limit, Mailbox location, Mailing label information, Maximum connections, Minimum password length, Network address restriction, Postal (ZIP) code, Postal office box, Profile, Remaining grace logins, Require a password, Require unique passwords, Security equal to, See also, State or province, Street address, Telephone, Title

Field Definitions

Use the applicable definitions in the following table to create the import control file.

A single-value property can contain only one entry (property). If you put more than one entry for a single-value property in the control file, only the last one is saved.

A multivalue property can contain more than one entry. If you want to replace existing values in existing users, be sure to set the Replace Value control parameter to Y. By default, all values are added to those already in the user object.

Table E-2
UIMPORT Field Definitions

Property	Property description
Account balance	Single-value property. In the data file, enter the beginning account balance for the user. If accounting is not turned on, this field has no use.
Account disabled	Single-value property. In the data file, enter Y if you want to disable this account. If you enter Y, you can't modify Password or Login script. The default is N; so if you don't want the account disabled, no field is required.
Account has expiration date	Single-value property. In the data file, enter the date in the form MM/DD/YY. It expires at 12:01 am on that date.
Allow unlimited credit	Single-value property. In the data file, enter Y to allow unlimited credit. Enter N to not allow unlimited credit. If accounting is not turned on, this field has no use. The default value for this property is N.
Allow user to change password	Single-value property. If you don't want the user to be able to change his/her password, enter N in the data file. The default is "Y"; so if you want to allow the user to change his/her password, no parameter is needed.
City	Single-value property. In the data file, enter the name of the city.

Table E-2 *continued*
UIMPORT Field Definitions

Property	Property description
Date password expires	Single-value property. In the data file, enter the date the password expires in the form MM/DD/YY. It expires at 12:01 am on that date.
Days between forced changes	Single-value property. In the data file, enter the number of days before requiring the user to change his/her password. The default for this value is 40. The possible values for this field are numbers 1–365. Do not set this value to 0.
Default server	Single-value property. In the data file, enter the name of the server from which the user gets his/her messages when they are sent with the SEND utility. In the data file, enter the Directory Services name of the server, including the context if the server is not in the same context as the user.
Department	Multivalue property. In the data file, enter the department name, code, number, or other type of information.
Description	Single-value property. In the data file, enter any type of information about the user that you want to import. The field must be enclosed in quotes (or the delimiter defined in the control file) if it contains commas or new-line characters. This field is a string; all data from the opening quote to the closing quote is considered part of the field.
Fax number	Multivalue property. In the data file, enter the fax number for each user you want to import.
Foreign Email address	Single-value property. In the data file, enter the foreign Email address of the user, which specifies a mailbox that resides in a foreign Email system. This information is used by NetWare MHS™ Services. The format for this value is Type:Value, where Type is the type of messaging protocol and Value is the user's address (in the format required by the foreign Email system). For example, in your data file you could enter a field such as SMTP:Jjones@Acme.com

Table E-2 *continued*
UIMPORT Field Definitions

Property	Property description
Foreign Email alias	Multivalue property. In the data file, enter the Foreign Email aliases of the user, which specify an object's aliases as known in a foreign messaging system. This information is used by NetWare MHS Services. For example, an MHS user (a user whose mailbox is located on an MHS Messaging Server) can have an X.400 alias—with an X.400 native name—so that X.400 users can use this alias to send mail to the MHS user. The format for this value is Type:Value, where Type is the type of messaging protocol and Value is the user's name (in the format required by the foreign Email system). For example, in your data file you could enter a field such as X400:g=joe;s=jones;ou=sales;o=acme;p=acmemd;a=att;c=us
Full name	Single-value property. In the data file, enter the user's full name. For example: Roland D Bruns
Generational qualifier	Single-value property. In the data file, enter the generational qualifier for the user's name. Usually this is a Jr., Sr., II or III. If the user's name is Bob Wilson III, enter III in the data file.
Given name	Single-value property. In the data file, enter the given name of the user. For example, for John Doe, enter John.
Grace logins allowed	Single-value property. In the data file, enter the number of grace logins allowed before the account is locked. 0 implies no limit.
Group membership	Multivalue property. This field allows you to organize groups of users who need similar rights and access to network resources. In the data file, enter the names of the groups to which this user belongs. If the group object is in a different context than the user, enter the complete Directory Services name of the group, including its context.

Table E-2 *continued*

UIMPORT Field Definitions

Property	Property description
Home directory	Single-value property. In the data file, enter the volume and path of the home directory in the following format: Volume Name:path If the volume is in a different context than the user, enter the complete Directory Services name. Separate the volume name and the path by a colon (:). Include the full path, including the final directory. For example, for user ABC1, create the home directory on volume object VOL1. VOL1 is in the same context as the user. VOL1:USERS\ABC1 This field in the data file overrides the Home Directory field in the control section.
Initials	Single-value property. In the data file, enter the middle initial of the user. For John I. Doe, enter I here.
Language	Multivalue property. In the data file, enter the language directories to be searched to find the message files for NetWare® utilities for this user. If more than one language directory should be searched, enter multiple language fields. The order is important. The first entry will be the first language directory to be searched, the second is the second language directory to be searched, etc.
Last name	Single-value property. In the data file, enter the user's last name. A value is required for this field when you are creating new User objects.
Location	Multivalue property. In the data file, enter any information about a user's work, department, or division location.

Table E-2 *continued*
UIMPORT Field Definitions

Property	Property description
Login script	The value of the login script is the name of a file containing the ASCII text for the login script. You can reuse the same file for all users or have a separate file for each user. In the data file, enter the path to the file as a DOS path. For example: C:\DIR1\MYLOGIN.SCR The maximum size of the login script is 16,384 bytes. If the file is larger than this, only the first 16,384 bytes is copied to the login script.
Low balance limit	Single-value property. If unlimited credit is not allowed, in the data file, enter the lowest balance the user can have and still receive services that are chargeable. If accounting is not turned on, this field has no effect. Also, if Allow unlimited credit is set to “Yes,” this field has no effect.
Mailbox ID	Single-value property. This is a unique name that specifies the directory in which all of the object’s inbound mail is placed. This information is used by NetWare MHS Services. In the data file, assign the user a mailbox ID using the user’s login name. If the user’s name has spaces in it, or if it uses illegal characters, assign the user a mailbox ID using the user’s login name, but eliminate the spaces and other illegal characters. If you do not assign a user a mailbox ID, UIMPORT does so automatically.
Mailbox location	Single-value property. In the data file, enter the name of the messaging server on which the user’s mailbox is located. If the messaging server is not in the same context as the user, enter the complete Directory Services name of the messaging server. For example, if the user’s mailbox is located on a messaging server named SERVMAN_MSG and the context of SERVMAN_MSG is Publications.Novell, enter SERVMAN_MSG.Publications.Novell.
Maximum connections	Single-value property. In the data file, enter the number of workstations the user can log in from. For no limit, enter 0.

Table E-2 *continued*
UIMPORT Field Definitions

Property	Property description
Minimum password length	Single-value property. In the data file, enter the minimum password length.
Name	Single-value property. A value is required for this field. In the data file, enter any unique user name. For example, you can use a student or employee identification number as the login name. This field is the user's login name in NDS.
Other names	Multivalue property. For example, if a user has two additional names that you want to import, enter both them in the data file and enter two field definitions in the import control file called "Other names."
Password	Single-value property. In the data file, enter a unique password for the user. Numbers, letters, and special characters may be used.

Table E-2 *continued*
UIMPORT Field Definitions

Property	Property description
Mailing label information	Multivalue property. This is a single property with up to six lines of information. If you want a user's entire address imported as a single property, use "Mailing label information" for each field that contains a part of the address. The first field is the first line of the postal address, the second field is the second line, etc. If you are going to define only four lines of the postal address in the data file, you need to include only four Mailing label information fields. Each line of the postal address in the data file must be a separate data string (i.e., separated by a comma or other separator). To import four lines of the postal address, you would type the following in the Fields section in the Control file: Fields …(other fields) Mailing label information Mailing label information Mailing label information …(other fields) In the data file, you might enter a line similar to the following: …,"1234 Any Street","Torrance","CA","98550",… You can use the Mailing label information field in place of Postal code, Post office box, State or Province, and City.
Postal (ZIP) code	Single-value property. In the USA, this is the five- or ten-digit zip code (84111 or 84111-1111). For a Canadian address this is the postal code.
Post office box	Single-value property. In the data file, enter the user's post office box.
Profile	Single-value property. In the data file, enter the name of the profile object to which this user belongs. This must include the complete Directory Services name of the profile object if the profile is in a different context than the user.

Table E-2 *continued*
UIMPORT Field Definitions

Property	Property description
Remaining grace logins	Single-value property. Normally this field is not imported. This is the number of grace logins still remaining. It is set to the same value as in “Grace logins allowed.” If you want this number to be different from the “Grace logins allowed” number, you must use the modify option in UIMPORT. For those users whose Remaining grace logins should be the same as the Limit grace logins, either don’t import this field or set it to the same number you entered for Limit grace logins.
Require a password	Single-value property. In the data file, enter Y if a password is required. If no password is required for this user, enter N.
Require unique passwords	Single-value property. If unique passwords are required, enter Y in the data file. If unique passwords are not required, in other words the user can reuse passwords, enter N.
See also	Multivalue property. Enter in the data file any other related objects. Enter the complete Directory Services name of the object if it is not in the same context as the User object.

Table E-2 *continued*
UIMPORT Field Definitions

Property	Property description
Skip	This is a unique processing option for UIMPORT. The values in the data file that correspond to Skip fields are ignored by UIMPORT. For example, if you exported into the data file users' birthdays and you do not want this information imported into NDS, enter "Skip" as the field definition. If you export data that you don't want to import, rather than reexporting the entire data file, you can simply specify "Skip" for the column that contains the information. Suppose you export to the data file a work and a home phone number, but you don't want to import the home phone number. Your data file might have a string like this: …,"801-555-4141","801-555-8677",… Your import control file would correspond like this: Fields … Telephone Skip … The 801-555-8677 field in the data file is ignored.
Security equal to	Multivalue property. In the data file, enter the name of the objects to which this user is security equivalent. This name must include the complete Directory Services name of the object if the object is in a different context than the user.
State or province	Single-value property. In the data file, enter the State or province of the user.
Telephone	Multivalue property. For example, if a user has three telephone numbers that you want to import, enter in the data file each of the three numbers. In the control file, you would need three "Telephone" field entries.
Title	Multivalue property. In the data file, enter the user's title.

Table E-2 *continued*
UIMPORT Field Definitions

Property	Property description
Volume restrictions	Single-value property. In the data file, enter the name of the volume object and the space restrictions on that volume in the following format: Volume object name:Restriction amount To remove volume restrictions, enter –1 (or any other negative number) for the restriction amount.

UIMPORT Field Name Changes

UIMPORT data field names have changed in NetWare 4.1*x*. Field names used in NetWare 4.02 are listed in the left column of the following table and new NetWare 4.1*x* names are listed in the right column.

4.02 UIMPORT Field Name	4.1*x* UIMPORT Field Name
Minimum account balance	Low balance limit
Login expiration time	Account has expiration date
Login grace limit	Grace logins allowed
Login maximum simultaneous	Maximum connections
Login disabled	Account disabled
Password expiration time	Date password expires
Password expiration interval	Days between forced changes
Password minimum length	Minimum password length
Password required	Require a password
Password unique required	Require a unique password
Password allow change	Allow user to change password
Postal address	Mailing label information

4.02 UIMPORT Field Name	4.1*x* UIMPORT Field Name
Security equals	Security equal to
Facsimile telephone number	FAX number
Telephone number	Telephone
New field	Foreign Email address
New field	Foreign Email alias
New field	Full name
New field	Generational qualifier
New field	Initials
New field	Mailbox ID
New field	Mailbox location

Examples of Files Used by UIMPORT

The following examples are based on records taken from a database sample that uses these fields:

Last name:
First name:
Middle initial:
Local address
    Street:
    City:
    State or province:
    Zip code:
Student number:
Year:
Major:
Cumulative grade point average:
Department:

Data File Created from Exported Database Fields

When you export your database records to a comma-separated ASCII file, the records appear in the data file as shown here:

“Jones”,“Adam”,“J”,“111 South 8th East”,“Salt Lake City”,“Utah”,“84007”,“2345”,“Sophomore”,“Environmental Engineering”,“2.8”,“Engineering Sciences”

“Smith”,“John”,“D”,“222 North Cerillos”,“Los Angeles”,“California”,“96000”,“2875”,“Senior”,“Accounting”, “3.0”,“Business Administration”

Corresponding Import Control File

Using the data file as a guide, you could set up the import control file to import the data file fields as shown here. This example assumes that you are creating new users in the NDS database:

Import control
- Name context=.administration.student_accts
- User template=y
- Create home directory=y
- Home directory path=”Students/Home”
- Home directory volume=”.SYSVOL.Student Records”

Fields
- Last name
- Given name
- Middle initial
- Mailing label information
- Mailing label information
- Mailing label information
- Mailing label information
- Name
- Skip
- Skip
- Skip
- Department

Note how the Name field corresponds to a student ID number. When the ID number is imported into NDS, it becomes the user's login name—which is the User object name.

Managing numbers is difficult because they don't uniquely identify a user. To avoid having to manage numbers, you can create a field of unique login names in your data file.

Data File Edited to Update User Objects

Suppose that later you wanted to update User object information and add properties that were not imported when the users were created.

For example, if you wanted to delete values from the "Middle initial" field, import new values from the "Year," "Major," and "Grade point average" fields, and change the separator used for all user information after Adam Jones, you would edit the data file as shown here:

"Jones","Adam","#DEL","111 South 8th East","Salt Lake City","Utah","84007","2345","Sophomore","Environmental Engineering","2.8","Engineering Sciences"

!Separator=/

"Smith"/"John"/"#DEL"/"222 North Cerillos"/"Los Angeles"/"California"/
"96000"/"2875"/"Senior"/"Accounting"/"3.0"/"Business Administration"

Import control parameters are initially set in the control file, but can be included in the data file. If you include control parameters in the data file, the parameter should be preceded by an exclamation point (!).

For example, to place the users in the Engineering.Novell context, and to change the separator to a semicolon (;) you would add the following lines to the data file:

!Name context=.Engineering.Novell.
!Separator=;

Corresponding Changes to the Import Control File

After editing the data file, you must change the import control file to reflect the changes you made.

In the following example, the “delete property” and “replace value” control parameters have been added to delete the marked properties and specify that you want properties in both single and multivalue fields to be replaced by new properties. Fields marked “Skip” are replaced by “See also,” so the properties are imported to the “See also” field for the users.

```
Import control
Name context=.administration.student_accts
    User template=y
    Create home directory=y
    Home directory path=students/home
    Home directory volume=.SYSVOL.Student Records
    Delete property=#DEL
    Replace value=y
Fields
    Last name
    Given name
    Middle initial
    Postal address
    Postal address
    Postal address
    Postal address
    Name
    See also
    See also
    See also
    Department
```

Creating User Objects with the UIMPORT Utility

Prerequisites

- ❑ A workstation logged in to the network, running DOS 3.30 or above or OS/2 v2.x, and using NetWare Client™ software
- ❑ A minimum of 512 KB of memory available on the workstation
- ❑ The Create or Supervisor object right to the container object where the User objects are created
- ❑ The Create or Supervisor file system right to the directory where user home directories are created (if applicable)

Procedure

1. **Generate a data file from within your database application.**

   For general instructions, see “Generating the Data File” on page 163. For specific instructions, see the documentation accompanying your application.

2. **Create an import control file.**

   If you have enough memory, save this file in the same directory in which you saved the data file. Otherwise, you must specify the path to both the data file and the import control file when you run UIMPORT.

3. **Run UIMPORT from the directory in which you saved the data file and the import control file.**

   At the DOS command line, type

   `UIMPORT [`*`control_file`***`] [`***`data_file`***`] [/C]`** <Enter>

   Replace *control_file* with the name of the import control file you created. Replace *data_file* with the name of the data file you generated from your database application. Use **`/C`** to run UIMPORT with continuous output.

If you don’t run UIMPORT from a directory that contains both the import control file and the data file, you must specify the path to each file.

Important

Importing hundreds or thousands of users may take several hours. Therefore, you might want to run UIMPORT at night.

4. (Optional) Route import errors to a file.

If errors occur during the import process, messages appear on your workstation screen. If you want the messages sent to a file, add the DOS "*>filename*" option to the command.

For example, to route the messages to a file called uimport.log in your home directory, use a command similar to the following:

```
UIMPORT [control_file] [data_file]
  >home\paul\uimport.log <Enter>
```

Note

When importing large groups of users, the performance of your server might begin to slow down. This reduction in performance is related to the amount of memory available for Directory Services and TTS™ to use with UIMPORT's numerous transactions. This reduction is related to the size of UIMPORT batches available server memory.

If you import large groups of users or experience decreased server performance while running UIMPORT, you can add server memory, process smaller batches of users, or process UIMPORT batches during periods of low server utilization.

For more information about	See
Control parameters	Table E-1 on page 168
Creating import files	"Repairing the NetWare Directory Database" in Chapter 5 of *Supervising the Network*
Field definitions	Table E-2 on page 173

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Index

C

D

E

F

G

H

I

K

L

M

N

O

P

Q

R

S

T

U

V

W

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