Chapter 1

Installing NetWare Services

There are many steps to installing NetWare® Services (NWS) and operating with client workstations on a network. The first step is to install and configure UnixWare.

See your UnixWare online documentation for details of structuring your NetWare Directory tree.

Use this topic to

- Install NetWare Services.
- Install NetWare Directory Services™.
- Install NetWare clients.

For an overview of the installation procedures contained here, refer to "Installation overview" (page 4).

If it is desired that NetWare servers and clients operate over TCP/IP instead of (or in conjunction with) IPX/SPX, the NetWare/IP system should also be installed.

Finally, administer the NetWare Services as described in your UnixWare online documentation.

Chapter 2

Introduction

NetWare Services® allow UnixWare systems to act as NetWare clients and UnixWare servers to act as NetWare servers.

The NetWare Services software runs on a UnixWare system and uses UnixWare resources to provide NetWare services. For NetWare users, a NetWare Services server looks and behaves like a NetWare server because it provides the following services:

- *NetWare Directory Services* (NDS™).

  Provides a global naming service that is distributed across the entire NetWare network with a single point of administration. NetWare users log in to the Directory tree and, with appropriate rights, have access to any resource on the network, regardless of physical location.

- *NetWare file services*.

  Supports multiple name spaces and a multi-level file access system. The name space feature allows users to view filenames in the naming conventions of their workstation's operating system. File access is controlled through trustee assignments to users and groups, inherited rights, and file attributes that can restrict rights to specific files.

- *NetWare print services*.

  Allows NetWare clients to access printing resources on both NetWare and UnixWare printers.

- *NetWare client support and utilities*.

  Allows workstations running DOS/Windows, Windows 95, OS/2 and UnixWare to log in to the NetWare server and share networked resources. NetWare provides each client type with a set of NetWare utilities that allow the users to configure their NetWare environment and to manage some aspects of the NetWare server.

- *NetWare account security*.

  Provides secure NDS authentication with private key/public key encryption as well as numerous login restrictions.

Installation overview

After UnixWare is installed, you can proceed with the NetWare Services installation as follows:

- Begin the installation using either the command line or the Application Installer. (See the topics "Installing using the command line" (page 8) and "Installing using the Application Installer" (page 8)).
- Either select a default configuration (as specified in "Installing with defaults" (page 10)) or customize (as specified in "Customizing the installation" (page 11)) your installation by doing the following:
  - installing your NetWare user license
  - configuring the server and *SYS:* volume parameters
  - selecting Client Kit options
- When NetWare Services installation is complete, enter the following commands to rebuild the kernel:

  cd /
  shutdown -y -g0 -i6

- Install NetWare Directory Services. (See Chapter 4, "Installing NetWare Directory Services" (page 15).)
- Install your NetWare clients.

  While not mandatory, this is the next phase of installation. If you selected to install the Client Kit, you have installed the images for creating NetWare client diskettes. If you choose to make client diskettes, go to "Making client diskettes" (page 32). Complete the process of installing clients using the *NetWare Client for OS/2 User Guide* and the *NetWare Client for DOS and Windows User Guide*.
- Set up your printers. For information on printers, refer to your UnixWare online documentation.

UnixWare package selections

NetWare Services requires the following UnixWare packages be installed:

For the server install	For viewing documents online install
nwnet	base
cmds	

Hardware and software requirements

These are the hardware requirements for NetWare Services:

- at least a 486/33 system
- a 3.5 inch diskette drive installed as drive A:
- the UnixWare system
- 24MB of physical memory
- 70MB free for disk space
- 16MB for the NetWare Client Kit

The installation program

You should be aware of the following procedures as you work in the installation program.

Making menu selections

To make a selection on the installation menus, use the Spacebar to insert an asterisk between the parenthesis. The asterisk indicates your selections.

The status line at the bottom of your screen indicates function key selections as follows:

⟨F1⟩	get help
⟨F2⟩	view parameter choices
⟨F10⟩ and ⟨Enter⟩	save your selections and continue
spacebar	toggle through selections and insert asterisks

Viewing system messages during installation

To view system messages during the installation you can use the System Logs Manager.

To access the System Logs Manager, perform either of the following steps whilest running in graphics mode:

- Enter **scoadmin** at the command line. When the **scoadmin** window appears, select "System", then select the System Logs Manager.
- Enter the following command:

  scoadmin system logs manager

NOTE When entering the name of a UnixWare manager on the command line, the manager name given as an argument to **scoadmin** is case-insensitive, so the following are equivalent:

scoadmin directory services install
scoadmin Directory Services Install

Exiting the installation

Permanent changes are made to your system only after you select "Accept all settings and install now" from the Installation Main Menu. If you want to make changes you can cycle through the menus again. If you want to exit completely, select "Exit without installing" on the Preinstallation Menu. No changes will be made to your system.

Chapter 3

Installing NetWare Services

This topic provides a step-by-step procedure for installing the NetWare® Services software. Keep a thorough record of the details of your installation: this can be invaluable if you need to recover from a system crash.

NOTE Use the **scoadmin** System Time Manager to set the computer's time and time zone. (The time synchronization feature in NetWare Directory Services™ uses the computer's time setting.) Access this utility as follows:

scoadmin system time manager

See the note on the case of characters in **scoadmin** command lines in "Viewing system messages during installation" (page 6).

Beginning the installation

You must install using one of the following methods:

- *The command line*.

  Use the command line if you are familiar with command formats. See "Installing using the command line" (page 8).
- *The Application Installer*.

  Use the Application Installer if you prefer to install using the graphical user interface (GUI). See "Installing using the Application Installer" (page 8).

With either method, you can install from any of these media:

- remote UnixWare install server
- CD-ROM

- QIC tape

Installing using the command line

Log in to the system as the system administrator. Depending on the medium from which you are installing, enter a command at the command line.

- *remote UnixWare install server*

  To install from an install server using the command line, enter

  pkgcat -s servername: nws | pkgadd -d -

  where ***servername*** is the name of the network install server where the NetWare Services software resides.

- *CD-ROM*

  To install from a CD-ROM using the command line, enter

  pkgadd -d cdrom1 nws

- *QIC tape*

  To install from a QIC tape using the command line, enter

  pkgadd -d /dev/rmt/ctape1

Installing using the Application Installer

NOTE You must have system administrator privileges to use the Application Installer.

To install NetWare Services using the Application Installer, complete these steps:

1. In graphics mode, start up the Application Installer using one of the following methods:

   - Enter **scoadmin** at the command line. When the **scoadmin** window appears, select "Software Management" then select the Application Installer.

   - Enter the following command:

     scoadmin application installer

     See the note on the case of characters in **scoadmin** command lines in "Viewing system messages during installation" (page 6).

   The "Application Installer" window appears and catalogs all the applications you currently have installed on your system, displaying them in the bottom part of the window.

2. Click on the selection box next to the "Install From:" option.

   A list of installation media appears.

3. Click on the medium that contains the NetWare Services software.

   Choose "Network" to install from a remote UnixWare install server, or "Tape" to install from a QIC tape, or "CD-ROM" to install from a CD-ROM.

   Packages available on the medium are displayed.

4. (Conditional) For a network installation, enter the name of the remote UnixWare server, then click on **Update View** to see the packages available.

5. Click on the uninstalled application or application set icon(s).

6. Click on **Install**.

   The "Add Application" window appears and may require your response. The new application or application set is installed on your system.

   > **NOTE** When you install applications, a mail message is sent to your mailbox. You can read this message from the "Mail" window or by using the **mailx**(1) command.

Installing NetWare Services

Regardless of whether you initiated the installation from the command line or from the Application Installer, a menu is displayed. Use the menu options as follows:

- To read the help screens associated with installation, select the "Learn about the installation procedure" option.
- To view a list of hardware and software requirements, select the "View system requirements" option.
- To continue the installation process, select the "Continue installation" option.
- To stop the installation, select the "Exit without installing" option.

To install NetWare Services, do the following:

1. Select "Continue installation".

   A menu appears.

2. Choose either "Accept all settings and install now" (to use the default settings) or "View or change default configuration" (to customize your installation).

You can also choose to return to the previous menu.

If you are using the default settings, go to "Installing with defaults" (this page).

If you are customizing your installation, go to "Customizing the installation" (page 11).

Use the following information to make your selection:

- To install the software using the default settings for each parameter, select the "Accept all settings and install now" option.
- To customize your installation and specify parameters, select the "View or change default configuration" option.
- To return to the Preinstallation menu, select the "Return to previous menu" option

Installing with defaults

NetWare Services allows you to install the software on your server by using system defaults.

If you select "Accept all settings and install now", the NetWare Services software is installed with the following defaults:

Server name	The name of your UnixWare system.
IPX internal network	Determined by a random-number generator.
Start NetWare at boot time	Yes
Mount point	*/SYS*
Control directory	*/etc/netware/control/SYS*
Name space	DOS, UNIX
NetWare user licenses	A zero-user system
Client kit	Client disk images for making DOS/Windows client diskettes are copied during installation and stored in */NWClient*.

NOTE For more information on default settings, refer to "Configuring the server" (page 12).

To complete a default configuration, go to Chapter 4, "Installing NetWare Directory Services" (page 15) to complete the installation.

Customizing the installation

If you select "View or change default configuration" from the Installation Main Menu, a menu appears.

You can select any or all of the menu options. If you choose not to install a particular component at this time, you can install it later by running the installation program again and selecting the component you want to install. Make sure there is no asterisk inside the parentheses of the components you don't want to select or have already installed, or they will be reinstalled.

Use the following information to determine your installation path:

If you want to install	Then select	Comment
Only the NetWare Services	NetWare Services	This selection allows you to install user licenses and configure server and volume parameters. Continue with the instructions in "Configuring the server" (page 12).
Only the Client Kit	NetWare Services Client Kit	This selection allows you to install diskette images for making NetWare client diskettes at a later time. See "Installing the client kit" (page 13).
NetWare Services, the Client Kit	NetWare Services, NetWare Services Client Kit	These selections allow you to install all components at one time. Information on each of these components follows. Continue with the instructions in "Configuring the server" (page 12).

NOTE For information on exiting the installation, refer to "Exiting the installation" (page 6).

Configuring the server

To install the user license and configure server and volume information, complete these steps:

1. From the Software Component Selection Menu, select "NetWare Services".

   A menu appears.

   NOTE If you prefer, you can install the server license at another time. In this case, your server defaults to a zero-user system. For information on adding licenses after installation, refer to "Adding and deleting licenses" (page 30).

2. Insert your *Server Connection License* diskette into the appropriate drive.
3. Select "Install NetWare user license".

   You can add another license diskette or continue the installation. After the licenses are installed, the License Menu reappears.

4. Select "Continue installation" or "Install another license".

   A menu appears.

5. Enter the server name.

   This is the name by which the server is known on the NetWare network. It must be from 2 to 47 characters long and can include alphanumeric characters, hyphens, and underscores. The default is the name of the UnixWare system on which the NetWare Services software is installed.

6. Enter your internal IPX address.

   This is the internal network number for this NetWare server. It must be expressed in hexadecimal notation (0-9, A-F) and is limited to eight digits. It must not conflict with the external network number (which you can view using the NetWare Setup icon in the Networking folder) and must be unique within all interconnected networks. The default is determined by a random-number generator.

7. Select Yes or No to indicate whether you want to start NetWare Services during the UnixWare boot process.

   Select Yes if you want the server to start automatically when you start UnixWare. Select No if you prefer to start the server yourself. The default is Yes.

8. Press ⟨F10⟩ to save your changes and continue with the installation.

A menu appears.

Use the following information to make your selections:

- The "Mount point" field specifies the root of this volume on the UnixWare filesystem. It can be anywhere on the UNIX filesystem, except on a control directory. The default is */SYS:*.

  Although the minimum space required is 31MB, we recommend a filesystem size of 50MB or 60MB for expansions such as queues, the NetWare Directory Services database, and users' directories.

- The "Control directory" field specifies the UNIX directory that contains control information (such as NetWare trustee information, the NetWare inodes file, and extended name files) for this volume. It can be anywhere on the UNIX file system except on any other NetWare volume. At least 20% of the maximum volume space must be available in this directory. The default is */etc/netware/control/SYS*.

- The "Name spaces" field specifies the client name spaces enabled for this volume. Values are "DOS, UNIX", or "DOS, UNIX, OS2".

  Select "DOS, UNIX" if only DOS and UNIX clients will access this volume.

  Select "DOS, UNIX, OS2" if OS/2 clients will also access this volume. The default value is "DOS, UNIX".

9. Enter the mount point path.

   NOTE If mount point is specified on the root file system, it is important that users not fill up the volume (and hence fill up the root file system under UNIX) or UNIX will not be able to run.

10. Enter the path to the control directory.
11. Specify Name spaces.
12. Press ⟨F10⟩ to save and continue.

If you chose to install the Client Kit, continue with the instructions in "Installing the client kit" (this page). If you chose to install only NetWare Services, go to "Completing the installation" (page 14).

Installing the client kit

To install the Client Kit, complete these steps:

1. From the Software Components Selections menu, select "NetWare Services Client Kit".

   The Client Kit Options menu appears.

2. Enter the name of the operating system(s) for which you want disk images made for NetWare Clients.

   Use the following information to help make your selection.

   - If you plan to create NetWare clients only on DOS/Windows systems, select the "MS-DOS/Win" option.
   - If you plan to create NetWare clients only on OS/2 systems, select the "OS/2" option.
   - If you plan to create NetWare clients on DOS/Windows and OS/2 systems, select the "MS-DOS/Win and OS/2" option.

   The actual diskettes are made when you use the **scoadmin** NetWare Client Disks utility. For information on using this application, refer to "Making client diskettes" (page 32).

3. Enter the path to the location where you want the disk images stored.

   The disk images require 16MB of disk space.

4. Press ⟨F10⟩ to save and continue.

Completing the installation

You must shut down your system to complete the installation. Enter the following commands to do this:

cd /
shutdown -y -g0 -i6

Installation is complete but NetWare Directory Services still must be installed. See Chapter 4, "Installing NetWare Directory Services" (page 15) for details.

For information on removing NetWare Services, refer to "Removing NetWare Services" (page 25).

Chapter 4

Installing NetWare Directory Services

Setting up and administering NetWare Directory Services™ requires planning and record keeping. Use the UnixWare online documentation for guidelines and suggestions on planning your Directory tree. Make a thorough record of your Directory tree installation, as this can be invaluable when recovering from a system crash.

If you have installed UnixWare and then NetWare Services® you are now ready to plan your NetWare Directory Services tree.

Beginning the installation

NOTE You must have system administrator privileges to use the Application Installer.

If you selected "No" in response to the option "Start NetWare at Boot Time" on the "Server Parameters" menu (Step 7 in "Configuring the server" (page 12)), you must start the server before attempting to install NetWare Directory Services. Refer to "Starting the server" (page 29).

Complete the following steps to install NDS:

1. In either text or graphics mode, start up the Directory Services Install application using one of the following methods:
   - Enter the command **scoadmin**. When the **scoadmin** window appears, select "NetWare" then select "Directory Services Install".
   - At the command line, enter the following:

     scoadmin directory services install

     See the note on the case of characters in **scoadmin** command lines in "Viewing system messages during installation" (page 6).

2. Select "Install Directory Services onto this Server".

   Based on how your network is configured one of the following appears. Go to the topic indicated.

   - If the prompt "Is this the first NetWare 4 server?" appears, go to "A nonlocatable Directory tree, or the first server" (this page).
   - If a menu that begins with the option "Install into tree TREENAME" appears, go to "A single Directory tree is found" (page 20).
   - If a list entitled, "Existing Directory Trees" appears, go to "Multiple directory trees are found" (page 21).

A nonlocatable Directory tree, or the first server

The following prompt appears if there is no previously installed NetWare server, or the server you are installing cannot see the previously installed NetWare server(s):

```
Is this the first NetWare 4 server?
```

Complete the steps in the appropriate topic:

- "The server cannot locate a Directory tree that was installed previously" (this page).
- "This is the first NetWare 4 server" (page 17).

The server cannot locate a Directory tree that was installed previously

1. From the "Is This the First NetWare 4 Server?" prompt, choose "No, Connect to Existing NetWare 4 Network".
2. A menu appears.

   - If 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 the "Recheck for NetWare 4 Network" option.

     If a single Directory tree is located, go to "A single Directory tree is found" (page 20).

     If multiple Directory trees are located, go to "Multiple directory trees are found" (page 21).

   - If 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".

Enter the name of the Directory tree. Enter the IPX internal network number of an existing NetWare 4 server in the Directory tree.

If a single Directory tree is located, go to "A single Directory tree is found" (page 20).

If multiple Directory trees are located, go to "Multiple directory trees are found" (page 21).

This is the first NetWare 4 server

1. Choose "Yes, This Is the First NetWare 4 Server".

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

   For help on rules for naming a Directory tree, press ⟨F1⟩.

2. Specify the Directory tree name.

   Each Directory tree must have a name that is unique across the internetwork. (Most organizations have only one Directory tree.)

   The tree name enables clients to

   - Access data on multiple servers in a Directory tree without logging in to each server.
   - Log in to different Directory trees by specifying the tree name.

   > **NOTE** 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.

3. Set up time synchronization.

   Time synchronization is important to NDS, because it

   - Monitors and adjusts a NetWare server's internal time to ensure consistency of reported time across the network.
   - Indicates when a server's time is synchronized with the rest of the network.
   - Provides timestamps to establish the order of events in the Directory.

   > **WARNING** Setting up time synchronization incorrectly can cause network synchronization problems within the Directory database.

   For more information on time synchronization, see your UnixWare online documentation.

   To enable time synchronization, you need to specify what type of time server category this server falls into.

- At the "Time Configuration Parameters" screen, verify or specify time synchronization parameters. There are four time server types:
  - Single Reference
  - Reference
  - Primary
  - Secondary

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

  NOTE Do not change the time server defaults without a clear understanding of time server types. Press ⟨F1⟩ for help.

  A screen appears. The cursor will be in the "Time server type" field.

- (Conditional) If you want to choose a different time server type, highlight the "Time Server Type" field.

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

4. Specify the server's context (name 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=Your Company).
   - 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 your UnixWare online documentation.

   For example, if your NetWare server were located in the "Sales_LA" group of the Sales department of a company called Acme, the server's context would be OU=Sales_LA.OU=Sales.OU=Acme.

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

   For information on context and naming conventions, see your UnixWare online documentation.

   - In the "Company or Organization" field, enter your company or organization name.

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

- (Optional) In the "Level 1 (Sub)Organizational Unit" field, enter an Organizational Unit name (such as a division or a department).

  Use this name to further specify your Directory tree. This could be a division name, a locality name, a department name, or anything that reflects your organization's structure.

  Notice that the information in the "Server Context" field is updated every time you enter a new name.

- (Optional) In the "Level 2 (Sub)Organizational Unit" field, enter an additional Organizational Unit name.
- (Optional) In the "Level 3 (Sub)Organizational Unit" field, enter an additional Organizational Unit name.

  You can manually enter more than three levels of Organizational Units into the "Server Context" field. Make sure you enter a period (.) as a delimiter between the name entries.

  NOTE For more information, see your UnixWare online documentation.

5. The default common name (CN) for the administrator of the first NetWare Services server in a Directory tree is ADMIN. The installation program creates this User object ADMIN directly under the Organization (O=) level.

   The administrator can

   - Manage this Server object.
   - Manage User objects in this container.
   - Manage the Directory tree (applies only to ADMIN created on the first NetWare Services server).

   You can change the name of user ADMIN using the **NETADMIN** (or NetWare Administrator) utility after the server is installed and you have set up a workstation.

6. Type the administrator's password.
   - At the prompt, reenter the password.
   - (Optionally) Make a record of the password.
7. To save Directory information, press ⟨F10⟩.

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

8. Review “How does the Directory tree appear now?” (page 23) and “What trustee assignments were created during the installation?” (page 24).

A single Directory tree is found

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

Choose an option from the menu:

- If you want to install into the displayed Directory tree, refer to “Install into the displayed Directory tree” (this page).
- If you want to install into a Directory tree that is not displayed, see “The server cannot locate a Directory tree that was installed previously” (page 16).
- If you want to create a new Directory tree, choose “Select Another Tree”. Then press ⟨Ins⟩. At the confirmation prompt, press ⟨Enter⟩. Follow the procedures under “This is the first NetWare 4 server” (page 17).

Install into the displayed Directory tree

To install the new NetWare Services server into the Directory tree displayed in the menu, continue with the procedures that follow.

NOTE Depending on its structure, the displayed Directory tree can be either a *simple* tree (only one level) or a *custom* tree (multilevel).

1. Choose “Install into Tree ***tree name***”.
2. Set up time synchronization by completing Step 3 in “This is the first NetWare 4 server” (page 17), then return here.

   After you set up time synchronization, either a password prompt or a login authentication and password prompt appears.

   - If a simple prompt reading “Admin Password” appears, enter the administrator password.
   - If this simple prompt appears and you want to customize the Directory tree, press ⟨F4⟩. If prompted, enter the administrator name. Enter the administrator password. Carry out Steps 4 and 5 in “This is the first NetWare 4 server” (page 17).
   - If a screen entitled “Directory Services Login/Authentication” appears, enter the administrator name (if prompted to do so). Enter the administrator password. Carry out Steps 4 and 5 in “This is the first NetWare 4 server” (page 17).

Multiple directory trees are found

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

1. Choose the Directory tree into which you want to install this server.

   A list of all Directory trees that are visible from this server appears. Most organizations have only one Directory tree.

   > **NOTE** 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 will prevent this server from sharing data within the desired Directory database.

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

   - (Conditional) If the Directory tree you want is not displayed, verify that an existing NetWare Services 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.
   - (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. Then, enter the IPX internal network number of an existing NetWare 4 server in the Directory tree.
   - (Conditional) If you need to create a new Directory tree on the network, press ⟨Ins⟩. At the confirmation prompt, press ⟨Enter⟩. Then follow the procedure given in "This is the first NetWare 4 server" (page 17).

2. Specify time synchronization parameters.

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

   - (Conditional) If you chose a simple Directory tree (only one level), a simple "Admin Password" prompt appears.

     If you want to install this server into the simple Directory tree, enter the administrator password.

     If you want to customize the simple Directory tree to create multiple levels, press ⟨F4⟩. If necessary, enter the administrator name. Type the administrator password. Carry out Step 4 in "This is the first NetWare 4 server" (page 17) to set up the server's context.
   - In the "Verify/Enter Time Configuration Information for this Server" screen, verify or specify time synchronization parameters.

Refer to your UnixWare online documentation for information on how to plan for time synchronization.

See Step 3 in "This is the first NetWare 4 server" (page 17) for instructions on how to configure time parameters, then return here.

- Press ⟨F10⟩ to save and continue.

  After you have finished setting up time synchronization, you are prompted to specify a Directory administrator login name and password.

3. (Conditional) If the administrator's name is not displayed, enter the administrator's name.

   Enter the complete name of the administrator. This could be

   - your login name
   - the name of any User object with the Supervisor object right to this context
   - user object ADMIN

     For example, enter

     CN=ADMIN.O=Your Company

     Or, if you specified a country, enter

     CN=ADMIN.O=Your Company.C=US

     NOTE For more information about complete context names, refer to your UnixWare online documentation.

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

   There also could be more than one administrator in your Directory tree.

   NOTE Without supplying the correct name, you cannot install this server as part of the Directory tree.

4. Enter the administrator's password.

   This password authenticates the administrator (the user installing the server) to the Directory. The server context screen appears.

5. Choose an existing NetWare context or specify a new one.

   If you want to place this new server into a context that has been previously defined, press ⟨Enter⟩ at each organizational level to view existing container objects and choose the object you need.

If you want to define a new context for this server, enter one or more new Organizations (O=) or Organizational Units (OU=). See the examples that follow.

You can either place this new server into a previously defined context or you can specify a new context. By defining a context that does not 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 4.1 server is

OU=NEW_PRODUCTS.OU=MARKETING.O= YOUR COMPANY

If you specify the new server's context as

OU=SALES.O= YOUR COMPANY

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

> **NOTE** By default, the installation utility adds a replica (duplicate) of the partition that contains the server's context only if the total number of existing replicas is less than three.
>
> You can modify partitions with the PARTMGR or NetWare Administrator utility, after server and workstation installations are complete.
>
> For more information on Directory partitions, see your UnixWare online documentation.

6. To save the Directory information, press ⟨F10⟩.

   A confirmation box appears.
7. Press ⟨Enter⟩ to select Yes.
8. Review "How does the Directory tree appear now?" (this page) and "What trustee assignments were created during the installation?" (page 24).

How does the Directory tree appear now?

The following objects were created in the Directory tree:

- server object
- volume objects (***servername****_SYS:* and other volumes you specified)
- user object ADMIN (the administrator who has Supervisor object rights to this context); the installation utility places this object directly under the Organization level
- user object Supervisor (for bindery services purposes only); this object can be recognized only from pre-NetWare 4.1 utilities (user object Supervisor

takes on User object ADMIN's password)

NOTE User object ADMIN is created only once, and only on the first server in the Directory tree.

These objects are placed in the same context you defined for your server.

What trustee assignments were created during the installation?

The following assignments were created:

- User object ADMIN has the Supervisor object right to the [Root] object. By inheritance, ADMIN also has the Supervisor right to all Volume objects in the Directory.
- [Public] has the Browse right to the [Root] object.

  [Public] is equal to the group EVERYONE in the NetWare 3 environment.
- Any container object has Read and File Scan rights to the PUBLIC directories of all system volumes in that container.
- The [Root] object (or security equivalent) of a tree has the Browse right to all User objects in that tree. This can be blocked by an Inherited Rights Filter or removed from a container's trustee list (ACL).
- The [Root] object has the Read right to the member property of any Group object.
- The [Root] object has the Read right to the following properties of any Volume object: host server name (the server that the physical volume resides on) and host resource (the physical volume).
- All User objects have the Read right to their own properties and to the properties of any profile they belong to. User objects also have Read and Write rights to their user login script.

For more information, see your UnixWare online documentation.

Exiting the Directory Services installation utility

The installation of the NetWare Directory Services is now complete.

To exit the Directory Services installation utility, select "Exit" from the Directory Services option menu.

If you want to go on to install NetWare clients, see Chapter 5, "Using NetWare Services applications" (page 27) and Chapter 6, "Installing NetWare clients" (page 35), and if you want to configure printers, refer to your UnixWare online documentation.

Removing NetWare Directory Services

Before removing NetWare Services, you must first remove NetWare Directory Services. For information on removing NetWare Directory Services, refer to your UnixWare online documentation.

Removing NetWare Services

NOTE You must have system administrator privileges to use the Application Installer.

Using the Application Installer

To remove NetWare Services using the Application Installer, do the following:

1. In graphics mode, start up the Application Installer using one of the following methods:
   - Enter the command **scoadmin**. When the **scoadmin** window appears, select "Software Management" then select "Application Installer".
   - At the command line, enter the following:

     scoadmin application installer

     See the note on the case of characters in **scoadmin** command lines in "Viewing system messages during installation" (page 6).
2. Select "nws" and click on **Remove**.

   You are prompted to confirm your request to remove NetWare Services.

Using the command line

To remove NetWare Services from the command line, open a Terminal window and enter

pkgrm nws

Screen messages indicate when the package has been removed successfully.

Chapter 5

Using NetWare Services applications

This topic includes procedures for using applications and instructions for the following tasks:

- starting and stopping the server
- adding and deleting licenses
- making client diskettes

The applications described in this topic are supplied by the "NetWare" option of **scoadmin**. To access these applications carry out either of the following at the command line:

- Enter **scoadmin**. When the **scoadmin** window appears, select "NetWare". This folder then expands to display the available applications.
- Enter the following:

  scoadmin ***application***

  The ***application*** argument is any of the options displayed by the "NetWare" folder, and described in the following list.

The applications available are as follows:

- Directory Services Install

  Install and remove NetWare Directory Services.
- Directory Services Repair

  Repair NetWare Directory Services. For more information, refer to your UnixWare online documentation.
- NetWare Licensing

Add and delete NetWare Services® licenses.

- NetWare Server Status

  Start and stop the NetWare Services server and dynamically display the server status.

- NetWare Volume Setup

  Create NetWare volumes, optimize volumes, repair volumes, and perform volume tasks. For information on administering volumes, refer to your UnixWare online documentation.

- NetWare Client Disks

  Make NetWare client diskettes from the images created during installation.

- NetWare Setup

  Configure NetWare protocols (IPX, SPX, RIP, and SAP) and NetWare Services (NDS, time synchronization, hybrid user, Watchdog, and more). Setup the NetWare UNIX Client (NUC). Setup the login environment for your NetWare Print Server. For information on NetWare Setup, refer to your UnixWare online documentation.

Using the server status functions

NOTE You must have system administrator privileges to use the Application Installer.

Using this application is a required step in doing the following:

- Shutting down the server for administrative services such as volume management
- Starting the server to install NetWare Directory Services

Checking server status

To check the current state of your server, start up the NetWare Server Status utility as follows:

1. In graphics mode, start up the NetWare Server Status utility using either of the following methods:

   - At the command line, enter **scoadmin**. When the **scoadmin** window appears, select “NetWare”, then select “NetWare Server Status”.
   - Enter the following:

     scoadmin netware server status

     See the note on the case of characters in **scoadmin** command lines in

"Viewing system messages during installation" (page 6).

The NetWare Server Status window then appears, displaying the status of the server.

2. (Optional.) Use the Directory Services Install utility if NDS has not yet been installed. To do this, enter, for example:

   scoadmin directory services install

3. Click on "Stop" to stop the server.

Starting the server

To start the server, complete these steps:

1. In graphics mode, start up the NetWare Server Status utility in either of the following ways:

   - At the command line, enter the **scoadmin** command. When the **scoadmin** window appears, select "NetWare", then select "NetWare Server Status".
   - Enter the following command:

     scoadmin netware server status

     See the note on the case of characters in **scoadmin** command lines in "Viewing system messages during installation" (page 6).

   The NetWare Server Status window appears, displaying the server's status.

2. Click on "Start".

   The following status message appears:

   ```
   The server is coming up. Please wait.
   ```

Alternately, the server can be started by entering the following command:

/sbin/tfadmin nwserver

NOTE This method causes server startup to proceed in the background. In order to monitor its progress, enter

tail -f /var/adm/log/osmlog

A message is displayed when the server is up, and that NetWare Directory Services can be installed. At this point, press INTERRUPT to exit from monitoring the startup log and return to the command line.

Stopping the server

To stop the server, complete these steps:

1. In graphics mode, start up the NetWare Server Status utility in either of the following ways:
   - At the command line, enter the **scoadmin** command. When the **scoadmin** window appears, select "NetWare", then select "NetWare Server Status".
   - Enter the following command:

     scoadmin netware server status

     See the note on the case of characters in **scoadmin** command lines in "Viewing system messages during installation" (page 6).

   The NetWare Server Status window appears, prompting for a "grace period" and whether mail should be sent to current users.
2. Click on the up and down arrows to choose a "grace period" before the actual shutdown.

   This allows users time to finish whatever they are doing and log out. The default value is 60 seconds.
3. (Conditional) Click Yes if you want to send a message to users, then type the message.
4. Click on **Stop**.

   The following message appears:

   ```
   The NetWare Server is coming down
   ```

   This message appears when the shutdown is in progress. You can click on **Abort** to cancel the shutdown.

The server can also be shut down using the **nwshut**(1Mnws) command:

nwshut -g*n*

where ***n*** is the grace period in seconds. Specifying 0 shuts down the server without a grace period.

Adding and deleting licenses

This topic describes how to add and delete NetWare server licenses.

You can add licenses during installation using the "Install NetWare user license" menu. If you choose not to add licenses at that time your server defaults to a one-user system.

NetWare Server licenses are additive. For example, if you install two 10-user licenses, you have 20 user licenses.

Use the NetWare Services Licensing application to add and delete licenses at your convenience. The licensing changes take effect the next time you start the server.

Adding licenses

To add user licenses, carry out the following steps:

1. In graphics mode, start up the NetWare Licensing utility using either of the following methods:
   - At the command line, enter **scoadmin**. When the **scoadmin** window appears, select “NetWare” then select “NetWare Licensing”.
   - Enter the following:

     scoadmin netware licensing

     See the note on the case of characters in **scoadmin** command lines in “Viewing system messages during installation” (page 6).

   The NetWare Licensing window appears.
2. Click on **Add** when the license number appears.

   A window appears with the following message:

   ```
   Insert license diskette in drive and press <Enter>.
   ```
3. Insert the license diskette into the appropriate drive.

   The license file containing the number of connections to be added to the system is copied to the hard drive. When the process is complete, the “Total” field changes to reflect the number of licenses.

   If this is the first license file you are adding, the Server Serial Number is updated. If this is not the first license file, this field is not changed. It always reflects the serial number of the first license file added.
4. Click on **Close** to close the window.

Deleting licenses

If you need to move user licenses from one server to another, use the following procedure:

1. Ensure that the server is not running. See “Stopping the server” (page 30) for details.
2. In graphics mode, start the NetWare Licensing utility using either of the following methods:

- At the command line, enter **scoadmin**. When the **scoadmin** window appears, select "NetWare" then select "NetWare Licensing".
- Enter the following:

  scoadmin netware licensing

  See the note on the case of characters in **scoadmin** command lines in "Viewing system messages during installation" (page 6).

The NetWare Licensing window appears.

3. Highlight the line in the list with the serial number and number of connections you want to delete. You can highlight more than one line at a time.
4. Click on "Delete".

   The Server Serial Number and Total lines reflect the change.
5. Click on "Close".

Making client diskettes

Use the following procedures to make diskettes to install NetWare clients on your network.

The number of diskettes required is determined by the operating system of the client for which you are making diskettes; screen information indicates the number required. The diskettes do not need to be formatted.

NOTE You must make all required diskettes in succession. If you need to stop during the process, you must start again with diskette 1.

1. In graphics mode, start the NetWare Client Disks utility using either of the following methods:
   - At the command line, enter **scoadmin**. When the **scoadmin** window appears, select "NetWare" then select "NetWare Client Disks".
   - Enter the following:

     scoadmin netware client disks

     See the note on the case of characters in **scoadmin** command lines in "Viewing system messages during installation" (page 6).

   NOTE You must have system administrator privileges to use the Application Installer.

   The NetWare Client Disks window appears.
2. Select one of the operating system options from the pull-down menu.

3. Click Yes if you want error-checking on each client diskette. The default is "No".

   Verifying diskettes requires more time.

4. Click on **OK** to initiate your selections.

   A window appears.

5. Insert an appropriately labeled diskette into the drive and click on **Apply**.

   A window appears indicating the system is copying the diskette. When it is complete, the "NetWare Client Diskette: make diskettes" window reappears.

   NOTE If you cancel during the procedure make sure the drive light is off, indicating the drive is available before you remove the diskette.

6. Insert the next diskette and click on **Apply** to continue making diskettes.

   Messages appear indicating the copy was successful.

With the diskettes for your NetWare clients complete, you are ready to install the clients. Go to Chapter 6, "Installing NetWare clients" (page 35).

Chapter 6

Installing NetWare clients

This topic provides a basic overview of the procedures for installing a NetWare client on your network.

Before you can continue setting up your network, you must install a single client. From a client, you can run either NetWare Administrator or **NETADMIN** to start creating objects on your network.

Installing NetWare client software

Before you can install the client software, you must have access to installation diskettes for NetWare Client™ software.

Use the information in "Making client diskettes" (page 32) to make client diskettes. When you have client installation diskettes available, use the following information to locate installation procedures for your particular client operating system:

- If you want to install NetWare client software for DOS and Windows clients, refer to "Installing a DOS and Windows Client" (this page).
- If you want to install NetWare client software for OS/2 clients, see "Installing an OS/2 client" (page 37)

Installing a DOS and Windows Client

DOS and Windows clients share the same installation program. The installation program runs within the DOS environment. The following list describes the prerequisites:

- An IBM PC (or compatible) with an XT, AT, 386, 486, or higher (SX or DX) processor.
- A hard drive or a floppy drive and diskette with the following amount of available disk space:
  - DOS only: 1.2MB
  - DOS and Windows: 4MB
- A network board installed in your client computer.
- Network cabling.
- (Optional) A computer cabled to the network and running Windows 3.1.

  If you are using Windows, close Windows before loading the installation program. The client installation program modifies some Windows files that are used when in Windows.
- At least one UnixWare NetWare Services server installed.
- The appropriate number of diskettes labeled as specified when you created the client diskettes.

Complete these steps to install the client:

1. Exit Windows.
2. Insert the NetWare Client for DOS and Windows Installation Diskette #1 into your diskette drive.
3. Change to the drive containing the installation diskette.

   For example, to install from drive A:, enter

   A:
4. Load the installation utility by typing

   INSTALL
5. Follow the installation instructions on your screen.

   Default settings for the NetWare Client software should be sufficient for an initial connection. You can do a standard installation with the default settings and configure other options later.

   Use the arrow keys to move between the fields. Press ⟨Enter⟩ to modify a particular field.

   NOTE Diskette #5 contains additional network drivers. If you are not prompted to insert the fifth diskette, your system does not require it.
6. Exit the installation utility by pressing the ⟨Esc⟩ key.

7. Reboot your computer.

   For your modifications or new installation to take effect, you need to reboot your computer.

Installing an OS/2 client

Review the following checklist to make sure you are prepared to install the NetWare Client software for OS/2. The following list describes the prerequisites:

- An IBM PC (or compatible) with a 386 or 486 (SX or DX) processor. OS/2 v2.x operates only with 386 (SX and DX) processors and above because of its 32-bit architecture.
- A hard disk with 4.5MB of storage.
- A network board installed in your client computer.

  NOTE If you specify an interrupt for the network board that is already being used by another device, you can still install the network board, but the network software will not run successfully.

- Network cabling.
- At least one UnixWare NetWare Services server installed.
- The appropriate number of diskettes labeled as specified when you created the client diskettes.

Complete these steps to install the client:

1. Start the OS/2 client and open an OS/2 full screen or window.
2. Insert the WSOS2_1 diskette into the diskette drive.
3. Change to the drive where you inserted the diskette and enter

   INSTALL

4. From the Installation menu, select “Requester on Client”.
5. Follow the screen prompts and the online help to finish installing the Requester.

   Because this computer is being installed to get you started with the network setup, you can do a standard installation with the default settings and configure other options later.

   During installation, a directory called *NETWARE* is created for the Requester files on the drive you booted OS/2 from.

6. Exit the installation program by selecting “Exit” from the Installation menu.
7. Remove the diskette from the drive, and then select the OS/2 shutdown feature to reboot the computer.

   For your modifications or new installation to take effect, you need to reboot your computer.

Chapter 7

Installing NetWare/IP

This topic provides installation and configuration of NetWare/IP (NWIP), which enables users of NetWare servers and clients to use TCP/IP as their transport protocol.

NWIP can coexist with IPX/SPX on the standard NetWare network, Any system can be configured to use the NWIP and IPX/SPX stacks simultaneously.

For a description of the NWIP protocol, see your UnixWare online documentation.

Installation

NetWare/IP is installed automatically as a part of the “nwnet” package, but it is not selected as the default transport protocol of choice. You must also install the “inet” package to be able to use the TCP/IP protocol stack. This is required so that IPX/SPX can be tunneled over UDP/IP.

Before NetWare/IP can be used, you must use the **Network Configuration Manager** in *Configuring LAN connections* to configure TCP/IP over the network interface(s), and then to configure IPX/SPX over TCP/IP. See your UnixWare online documentation for a description of the NWIP configuration parameters.

NOTE Only *root* or the owner of the system can use the **Network Configuration Manager**.

Once NetWare/IP has been installed and configured, the system must be rebooted for the changes to become effective.

Configuration

NWIP configuration can be carried out using the **Network Configuration Manager**. See your UnixWare online documentation for a description of the NWIP configuration parameters.

NOTE NWIP does not function as a forwarding gateway. While all of the SAP/RIP information received from the IPX stack will not yet be sent to the NWIP database, all of the SAP/RIP information received from the NWIP database will be forwarded to the IPX side.

Deconfiguration

To deconfigure NWIP, use the **Network Configuration Manager** to remove IPX/SPX from over TCP/IP.

The system must be rebooted for the changes to take effect.

Logging and tracing

The NWIP daemon logs all of its activities, warnings and errors in the log file *nwipd.log* in the standard log directory, */var/adm/log*. These are also all displayed on the console.

Four levels of message are logged by the daemon:

- ERROR
- WARNING
- INFO
- DEBUG

The command line switch can be used for setting the level of messages to be logged. When logging to the file, the existing log file is renamed to *nwipd.log.old* after a pre-determined number (300) lines have been accumulated, and a new log file created for subsequent lines. This prevents the log file from growing too large.

Messages logged to the file have the following format:

Label: ***Date***: ***Type***: ***Message***

Label always reads "UX:nwipd", ***Date*** gives the date and time at which the message was generated and ***Type*** is one of ERROR, WARNING or INFO (DEBUG is logged as type INFO).

The following are examples of logged messages. All messages are read from message catalogs, and are thereby locale-dependent.

```
UX:nwipd: Fri Aug 6 12:09:43 1997: ERROR: No device
   configured (lan_1_adapter) for NW/IP

UX:nwipd: Fri Aug 6 12:09:43 1997: ERROR: Exiting with
   error code 1
```