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TM

Utilities Reference

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NETWORK COMPUTING PRODUCTS

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How to Use This Manual

Overview

Utilities Reference gives you essential information about NetWare® utilities. For more information about each utility, see the online help for that utility.

For step-by-step instructions to accomplish specific tasks, see *Supervising the Network* or other manuals that apply to your task. For information on NetWare terminology and concepts, see *Concepts*.

Some new utilities have been included with NetWare 4™. Some NetWare utilities have been discontinued, while others have been combined with related utilities. For a complete listing of these utilities, see *New Features*.

Before you can work effectively with NetWare 4 utilities, you must understand basic information about NetWare Directory Services™. See *Introduction to NetWare Directory Services*.

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chapter

1

Command Syntax

The command syntax appears at the beginning of each command line utility. The following MAP example explains syntax conventions:

MAP [P | NP] [option] drive:= [drive:|path]

Table 1-1
Command Syntax

Convention	Explanation
MAP	Uppercase words. Type these words as shown. (However, you can use uppercase or lowercase.)
[]	Square brackets. The item enclosed in brackets is optional: you can enter the command with or without the item.
	Vertical bar (either, or). You can use either item, but not both.
path	Italicized words. These words are variables. Replace them with the information pertinent to your task. In the MAP example, <i>path</i> or <i>drive:</i> is replaced with the path or drive to be mapped.
[[]]	Nested square brackets. The enclosed items are optional, but if you use the items within the innermost brackets, you must also use the items within the outer brackets.



chapter

2 *Utilities*

ABORT REMIRROR

Purpose

Use at the server console to stop remirroring a logical partition.

Syntax

ABORT REMIRROR *number*

Parameter	Use to
<i>number</i>	Specify the number of the logical partition you want to stop remirroring.



To view a list of disk partitions, execute the MIRROR STATUS command. See “MIRROR STATUS” on page 137.

Example

To stop remirroring logical partition 2, type

ABORT REMIRROR 2

Additional Information

Topic	See
Restart remirroring	“REMIRROR PARTITION” (page 247).

ACTIVATE SERVER

Purpose

Use at the server console to

- ◆ Load the MSEngine for the NetWare 4.1 SFT III system™.
- ◆ Synchronize the memory of both SFT III servers.
- ◆ Remirror the disks from one SFT III server to the other. (The SFT III server where you type ACTIVATE SERVER becomes the primary server.)
- ◆ Execute MSSTART.NCF and MSAUTO.NCF.

Syntax

ACTIVATE SERVER [parameter...]

Parameter	Use to
-na	Prevent running the MSAUTO.NCF file you created in INSTALL. This parameter is useful if you are changing commands in MSAUTO.NCF.
-ns	Prevent executing the MSSTART.NCF file you created in INSTALL. This parameter is useful if you want to change the boot process.
Both (-na -ns)	Load the MSEngine without executing MSAUTO.NCF or MSSTART.NCF.

Using ACTIVATE SERVER

- ◆ You must execute MSERVER before using this utility.
- ◆ If the MSAUTO.NCF file does not exist, ACTIVATE SERVER prompts you for an MSEngine name and an IPX™ internal network number.
- ◆ Putting ACTIVATE SERVER in the IOSTART.NCF file might cause synchronization problems.

If both servers execute ACTIVATE SERVER simultaneously, the utility might load two separate, unsynchronized MSEngines, and both servers would assume the primary server role.

ADD NAME SPACE

Purpose

Use at the server console to store non-DOS files (such as Macintosh* files) on a NetWare® volume.

Important  Before you can use this command, you must load a name space module. See "LOAD" on page 114.

Syntax

ADD NAME SPACE [name [TO [VOLUME]]] volume_name

Parameter	Use to
(no parameter)	Display the loaded name spaces.
<i>name</i>	Specify the name of the name space module you loaded. Supported names are
	Macintosh OS/2 FTAM NFS
<i>volume_name</i>	Specify the name of the volume you want to store the non-DOS files on.

Using ADD NAME SPACE

- ◆ You only need to add a name space to a volume once by using the ADD NAME SPACE command.

Each time you mount a volume to which you added a name space (for example, each time you bring up the server), the corresponding name space module is autoloaded.

Note 

Since you don't need to add a name space to a volume each time the server comes up, you don't need to put the ADD NAME SPACE command in the AUTOEXEC.NCF file.

- ◆ When name space support is added to a volume, another entry is created in the directory table for the directory and file naming conventions of that name space (file system).

Additional Information

Topic	See
Adding name space support	"Setting Up a Volume to Store Non-DOS Files" in Chapter 7 of <i>Supervising the Network</i> .

ATCON

Purpose

Use at the server console to

- ◆ Monitor the activity of AppleTalk* network segments
- ◆ Examine the configuration of the local AppleTalk router
- ◆ Diagnose operational problems in network segments that support AppleTalk
- ◆ Verify the connectivity of an AppleTalk router to the rest of the internetwork
- ◆ Monitor the status of AppleTalk Update-based Routing Protocol (AURP)

Syntax

LOAD ATCON

Using ATCON

When you load ATCON, an “Available Actions” menu appears. You access ATCON features from this menu.

“ATCON Menu Options” on page 9 lists the ATCON options.

ATCON Menu Options

Option	Use to
AURP Information	View the status of the Internetwork Protocol (IP) Tunnel for AURP and its peers. (Available only if AURP is enabled.)
Interfaces	View addressing information about interfaces directly connected to the AppleTalk router.
Log Files	Set logging levels for AppleTalk messages. View NetWare system log and volume log files.
Lookup Network Entities	Query for services available on the AppleTalk network.
Packet Statistics	View statistics maintained by the AppleTalk router.
Protocol Configuration	View the configuration of the AppleTalk protocol stack. This is a read-only screen.
Routing Table	View the AppleTalk router's Routing Table Maintenance Protocol (RTMP) table. This table lists all destinations the AppleTalk router can reach.
Zones List	View the list of zones known to this AppleTalk router. This list should be identical to the one displayed by the Macintosh Chooser.

Additional Information

Topic	See
AppleTalk protocol	<i>NetWare AppleTalk Reference</i> .
AURP	<i>NetWare AppleTalk Reference</i> .

ATOTAL

Purpose

Use at a workstation to total the accounting charges on your network.

Syntax

```
ATOTAL [destination path\filename] [/C]
[/? | /VER]
```

Parameter	Use to
<i>destination path</i> <i>/filename</i>	Redirect the output of ATOTAL to a file.
/C	Scroll continuously through the report of accounting charges.
/?	View online help. All other parameters are ignored when /? is used.
/VER	View the version number of the utility and the list of files it uses to execute. All other parameters are ignored when /VER is used.

Using ATOTAL

- ◆ You must have access to the SYS:SYSTEM directory of the server you want information for. (You can either run ATOTAL from the SYS:SYSTEM directory, or have a search drive mapped to it.)
- ◆ You must have the Supervisor object right on the server.

- ◆ Accounting must be activated before ATOTAL so that ATOTAL has access to the data file accounting creates (NET\$ACCT.DAT).
- ◆ Use ATOTAL to display the accounting information for a server. ATOTAL displays the following information for each day:
 - ◆ Connect time
 - ◆ Blocks read
 - ◆ Blocks stored per day
 - ◆ Server requests
 - ◆ Blocks written

Examples

- ◆ To redirect the output of ATOTAL to a file named ACCT on C:, type

ATOTAL >C:\ACCT

- ◆ To scroll the display continuously, type

ATOTAL /c

Additional Information

Topic	See
Accounting	“Accounting” in <i>Concepts</i> .

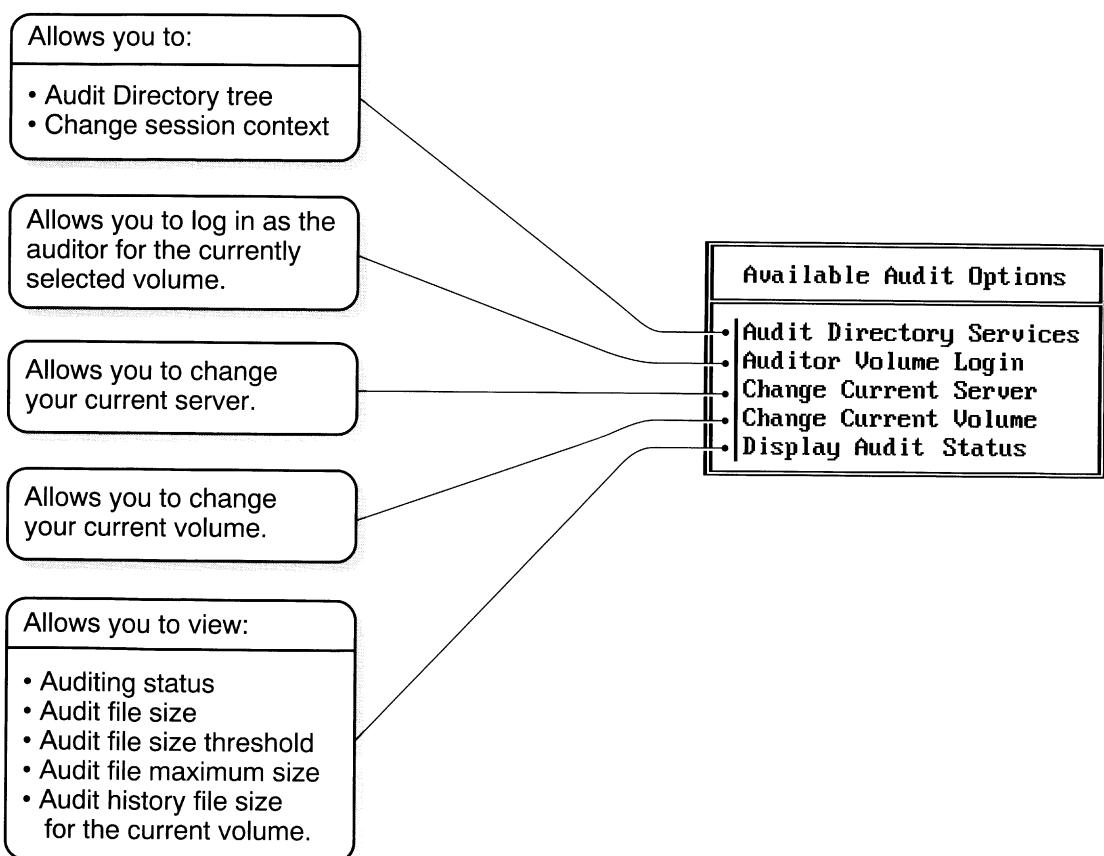
AUDITCON

Purpose

Use at a workstation to audit network transactions.

Figure 2-1 shows the functions available in the AUDITCON utility.

Figure 2-1
AUDITCON
Functions



Syntax

AUDITCON [/VER]

Parameter	Use to
/VER	View the version number of the utility and the list of files it uses to execute. All other parameters are ignored when /VER is used.



For help with tasks, press **<F1>** in the utility.

Using AUDITCON

- ◆ Use AUDITCON to ensure that transactions are accurate and that confidential information is secure.
- ◆ AUDITCON allows individuals, acting independently of network supervisors and others, to audit network transactions.
- ◆ Auditors can audit NetWare Directory Services™ (NDS) events and those events specific to a volume's file system or server.

File system auditing is enabled at the volume level; NDS™ auditing is enabled at the container level.

- ◆ Auditors can track network events and activities, but they can't open or modify files (other than audit data and audit history files) unless they are granted appropriate rights by the network supervisor.

Additional Information

Topic	See
Auditing	"Auditing" in <i>Concepts</i> "What Is NetWare Auditing?" in Chapter 8 of <i>Supervising the Network</i> .
Setting up and using the auditing feature	"Enabling Auditing" in Chapter 8 of <i>Supervising the Network</i> .
Selecting events, users, or files and directories to be audited	"Selecting Items to Audit" in Chapter 8 of <i>Supervising the Network</i> .
Setting an auditing password for the volume	"Setting Passwords" in Chapter 8 of <i>Supervising the Network</i> .
Viewing auditing information in the audit data or history file	"Maintaining Audit Files" in Chapter 8 of <i>Supervising the Network</i> .

BIND

Purpose

- ◆ Use at the server console to link a communication protocol to a network board and its LAN driver. Unless you link the protocol to the board, the board can't process packets.
- ◆ You can also use either INETCFG or INSTALL to link the network boards and their LAN drivers to the communication protocols. See "INETCFG" on page 95 or "Loading and Binding LAN Drivers" in Chapter 7 of *Supervising the Network*.

Note 

Before you bind a protocol to a network board and LAN driver, you must install the network board and load the LAN driver.

Syntax

```
BIND protocol [TO] lan driver | board name [driver  
parameter...] [protocol parameter...]
```

Bind Parameters

Parameter	Use to
<i>protocol</i>	Specify the communication protocol.
<i>lan driver board name</i>	Specify either the LAN driver name or the network board name.
<i>driver parameter</i>	Identify a particular network board.
	If you specified a network board name, you do not need to specify driver parameters.
	If you specified a LAN driver and your server has more than one instance of the LAN driver loaded, use a driver parameter to specify the particular board the driver is running.
	For a list of valid driver parameters, see “Driver Parameters” on page 16.
<i>protocol parameter</i>	Specify the protocol parameters required for the protocol you are binding. See “Protocol Parameters” on page 18.

Driver Parameters

Depending on your system, one or more of the following parameters can be used to identify a particular board.

Parameter	Use to
<i>DMA=number</i>	Specify the DMA channel for the board. Use the same channel number you did when you loaded the driver.
<i>FRAME=number</i>	Specify the frame type for the board. Use the same type you did when you loaded the driver.
<i>INT=number</i>	Specify the interrupt number for the board. Use the same interrupt number you did when you loaded the driver.

Parameter	Use to
MEM= <i>number</i>	Specify the memory address for the board. Use the same memory address you did when you loaded the driver.
PORT= <i>number</i>	Specify the I/O port for the board. Use the same I/O port number you did when you loaded the driver.
SLOT= <i>number</i>	Specify the network board by the lot it was installed in. Use this parameter with microchannel and EISA computers. Specify the same slot number you used when you loaded the driver.
NODE= <i>number</i>	Specify the node address for the board. This is a 12-digit hexadecimal number.

Protocol Parameters

Protocol/Parameter	Use to
For IPX protocol: NET= <i>number</i>	Specify the IPX external network number. This is the number of the cabling system attached to the board. If the board is attached to an existing cabling system, use the same IPX external network number as used by other boards of the same frame type attached to this cabling system. Do <i>not</i> use the same number that was used by boards of a different frame type.
For other protocols: Refer to the documentation that comes with the protocol and consult NetWire® or your Novell Authorized Reseller ^{CM} .	If the board is attached to a new cabling system or if it is the first board of its frame type attached to the cabling system, you can enter any hexadecimal number of up to eight digits, as long as the number is different from all other network numbers. (See "Network numbering" in <i>Concepts</i> .) Remember that all boards of the same frame type attached to the same cabling system must use the same IPX external network number for that cabling system. Specify the information required by the particular protocol.

Using BIND

- ◆ You may not need to use the BIND command unless you want to add new LAN drivers after the initial server installation.
- ◆ You can use INSTALL to load LAN drivers and bind them with the IPX protocol or nonrouting TCP/IP or AppleTalk protocols. INSTALL places the BIND commands in the AUTOEXEC.NCF file after you load the LAN drivers. Then each time the server comes up, the LAN drivers are automatically bound to the protocols.
- ◆ You can also use INETCFG to load and bind LAN drivers. INETCFG places the BIND statements in the INITSYS.NCF file.
- ◆ If you use only the IPX/SPX protocol, you can add the BIND statement to the AUTOEXEC.NCF file.

Additional Information

Topic	See
Binding a protocol to a driver	<p>“INETCFG” (page 95).</p> <p>“Loading and Binding LAN Drivers” in Chapter 7 of <i>Supervising the Network</i>.</p>
Viewing a list of communication protocols	“PROTOCOL” (page 228).
Loading LAN drivers	“LOAD” (page 114).

BRGCON

Purpose

Use at the server console to view the following managed objects implemented through Simple Network Management Protocol (SNMP) on your NetWare for OS/2* bridge:

- ◆ Basic bridge configuration information
- ◆ Spanning tree information for the bridge
- ◆ Transparent bridging information
- ◆ Port information and statistics, including spanning tree configuration, source route bridge configuration, and transparent bridge configuration
- ◆ Interfaces table

Syntax

LOAD BRGCON

Using BRGCON

- ◆ When you load BRGCON, an “Available Options” menu appears. You access BRGCON features from this menu.

The menu options are:

Option	Use to
SNMP Access Configuration	Select a bridge to monitor. You can monitor the local system (the default), or you can monitor a remote system by using IPX or TCP/IP. You can also set the poll interval to specify how often the information is retrieved through SNMP.
View Configuration	View basic bridge configuration information.
Spanning Tree Information	View spanning tree protocol information.
Transparent Bridging Information	View information about transparent bridging, or view the Filtering/Forwarding table.
Ports	View a list of active ports for the bridge. (View information about a port by selecting it.) You can also access source route, transparent, and spanning tree per port information.
Interfaces	View a list of supported network interfaces. (View information about an interface by selecting it.)

- ◆ BRGCON also lets you set some objects through SNMP, such as
 - ◆ The label and priority of the spanning tree
 - ◆ The maximum age, hello time, and forward delay of the spanning tree when it is the root bridge
 - ◆ The aging time of the transparent bridge
- ◆ Generally, the local NetWare node is the target of BRGCON. However, you can access any bridge that implements the Management Information Base (MIB) bridge by using BRGCON. This can be done over UDP/IP or IPX transports.

BROADCAST

Purpose

The SEND console command has the same functionality as the BROADCAST command from NetWare 2 and 3. (The BROADCAST command is also available in NetWare 4.)

See “SEND” on page 286.

CAPTURE

Purpose

Use at a workstation to set printer and printing parameters for applications' use.

Syntax

```
CAPTURE [P=printer | Q=queue] L=number [/option...]
[/? | /VER]
```

Additional Information

Topic	See
Using CAPTURE	“Using CAPTURE” in <i>Print Services</i> .

CD

Purpose

Use at the server console to monitor and administer a CD-ROM disc used as a NetWare volume.



CD is available only after you have loaded CDROM. If you use CD without CDROM loaded, you will get an “Unknown command” error message.

Syntax

CD [parameter]

Parameter	Use to
HELP	Display help information for CD.
MOUNT	Mount a CD-ROM volume.
DEVICE LIST	For more information on using this parameter and its options, see “MOUNT Parameter” on page 26.
VOLUME LIST	List CD-ROM devices.
DISMOUNT	For more information, see “DEVICE LIST Parameter” on page 27.
CHANGE	List volumes identified on CD-ROM devices.
	For more information, see “VOLUME LIST Parameter” on page 28.
	Dismount a CD-ROM volume.
	For more information, see “DISMOUNT Parameter” on page 29.
	Change the media in a CD-ROM drive.
	For more information, see “CHANGE Parameter” on page 29.

Parameter	Use to
RENAME	Rename a CD-ROM volume For more information, see “RENAME Parameter” on page 30.
DIR	View the contents at the root level of a CD-ROM volume. For more information, see “DIR Parameter” on page 31.
GROUP	◆ Assign a group number. ◆ List defined groups and their group numbers. For more information, see “CHANGE Parameter” on page 29.
PURGE	Purge hidden index files created by CD-ROM volumes. For more information, see “PURGE Parameter” on page 32.

Using CD

The following subsections describe the use of each CD command parameter.

MOUNT Parameter

To mount a CD-ROM volume, type

```
CD MOUNT [object number] | [volume name] [/name space]  
          [/option...]
```

- ◆ Specify either the object number or volume name. The mounted CD-ROM volume names must be unique.
- ◆ Supported name spaces: NFS and Macintosh. To add Macintosh name space support, use /MAC. To add NFS* name space support, use /NFS.

If the name space module isn't loaded, the volume with the specified name space support won't mount.

CD MOUNT Options

Option	Use to
/R	Rebuild the index file for a CD-ROM volume. Use this option when remounting a volume if you are changing its name space support since the last time you mounted it (either adding or deleting name space support). Important: If you don't rebuild the index file, the parameters you used the first time you mounted the volume will be used.
/I	If you erroneously enabled block suballocation or turned on file compression and subsequently corrupted the data, use this command to rebuild the volume's index file. Mount a volume even if importing errors are found and only some files on the CD-ROM disc are available.

Option	Use to
/X	Exclude one or more directories on the CD-ROM. For example, to exclude the DOS directory that is at the root of the CD-ROM (and any subdirectories beneath it), type CD MOUNT 3 /X=DOS
/G = <i>group number</i>	Set default volume group access rights while mounting the volume. To assign access rights to one group, replace <i>group number</i> with the group number. (To view existing group numbers or to set a new group number, use the CD GROUP command.) If you don't set any group access rights for a volume, access rights are granted to group EVERYONE .



When a CD-ROM disc is being mounted or changed, CD-ROM devices are deactivated so device configuration information can be updated.

DEVICE LIST Parameter

This parameter displays the list of CD-ROM drivers, as shown in Figure 2-2.

Figure 2-2
CD ROM Device List

CD ROM Device List					
No.	Act.	Device Name	Vol Name	Mounted	
9	Y	Device #1 SONY CDR0M CDU-541 (5D000000	ALR_DISC	Y	

Devices are listed in groups of 10. If you repeat the command, the next group of 10 devices is listed. The list includes the following information for each device:

- ◆ No. (Media Manager object number): Identifies each CD-ROM volume.

The object number is used in the CD MOUNT and DISMOUNT commands. (This number is not the same as the SCSI ID associated with this device or the device number.)



The Media Manager object number is hereafter called *object number*.

- ◆ Act. (Active status): Indicates whether the CD player is active.
- ◆ Device Name: Indicates the number of the device and lists hardware-specific information about the CD player.
- ◆ Vol. (Volume name): Indicates the name of the CD volume that is established when the CD-ROM label is scanned by the device.
- ◆ Mounted: Indicates whether the volume is mounted.

VOLUME LIST Parameter

To list volumes identified on CD-ROM devices that the system knows about, type

CD VOLUME LIST

Volumes are listed in groups of 10. If you repeat the command, the next group of 10 volumes is listed. The list includes the following for each volume: object number, active status, device name, volume name, and mounted status. For a definition of these terms, see “DEVICE LIST Parameter” on page 27.

The CD VOLUME LIST command doesn’t display information for devices that don’t have media present.

DISMOUNT Parameter

To dismount a CD-ROM volume, type

CD DISMOUNT [object number] | [volume name]

- ◆ Specify either the object number or the volume name.

After CD DISMOUNT is executed, all system resources are returned to the system.

CHANGE Parameter

To change the media in a CD-ROM drive, type

**CD CHANGE [object number] | [volume name]
[/name space] [/option]]**

- ◆ Specify either the object number or volume name.
- ◆ Using name space parameters is optional. To add name space support, enter the /MAC or /NFS name space, or use both name spaces.
- ◆ The CHANGE parameter has the same options as the MOUNT parameter. For a description of valid options, see "MOUNT Parameter" on page 26.

The CD CHANGE command dismounts the volume. Then you are prompted to replace the media.



Note Don't remove a CD that is mounted until you're prompted.

After you remove the CD, replace it with a new disc. Wait for it to completely spin up and then press <Enter>.

The media is mounted as a NetWare volume with the options you set.

RENAME Parameter

Use the CD RENAME command when you have multiple CD-ROM discs with the same volume name. The system will not allow you to mount multiple volumes with the same name.

To view the names of mounted volumes, use the CD RENAME command with no parameter.



You must dismount the volume before you can rename it.

To rename the CD-ROM volume, type

CD RENAME [/D = [object number] [new volume name]]

Enter the object number and the new volume name. This new name is assigned to the volume.

To mount a volume that you have renamed, you must use the /R parameter to rebuild its index file. For more information, see “MOUNT Parameter” on page 26.

DIR Parameter



Before you can use CD DIR on a volume, you must dismount the volume.

CD DIR allows you to view the contents at the root level of a CD-ROM volume. (Each CD-ROM is treated as one volume for NetWare access.)

To view the contents of a root directory, type

CD DIR [object number] | [volume name]

- ◆ Specify either the object number or the volume name.

Directory entries are listed in DOS format.

GROUP Parameter

The GROUP parameter can be used to assign a group number or to view a list of defined groups.

To assign a group number, type

CD GROUP [group name] [group number]

- ◆ Replace *group name* with the group name defined on the directory.
Replace *group number* with a group number (1 through 9).
- ◆ Group EVERYONE is group zero (0).



Only one group can have access rights to a volume. The default group is EVERYONE.

To list defined groups and their group numbers, type

CD GROUP

PURGE Parameter

Use the CD PURGE command to purge hidden index files created by CD-ROM volumes. (If you mount many different CD-ROM discs, hidden index files can accumulate and take up disk space.)

Important  Dismount all CD-ROM volumes before executing the CD PURGE command.

To purge index files for all CD-ROM volumes, type

CD PURGE

Additional Information

Topic	See
Mounting and using a CD-ROM as a volume	"Using a CD-ROM as a NetWare Volume" in Chapter 7 of <i>Supervising the Network</i> .
Administering a CD-ROM as a volume	"Administering a CD-ROM as a NetWare Volume" in Chapter 7 of <i>Supervising the Network</i> .
Media commands	"MEDIA" (page 134).
Magazine commands	"MAGAZINE" (page 124).

CDROM

Purpose

Use at the server console to allow a CD-ROM disc to function as a NetWare volume.

Syntax

LOAD [path]CDROM

Parameter	Use to
<i>path</i>	Specify the path to CDROM.NLM if you moved it from the default directory.

Using CDROM



Treat the CD-ROM as a read-only volume. Don't enable block suballocation or use file compression on the volume. These actions corrupt the CD-ROM volume index data.

- ◆ CDROM won't load unless you have loaded the NWPA.DSK NPA driver (an I/O device-independent driver that interfaces with the Media Manager).
- ◆ NetWare 4.1 supports CD-ROM volumes mounted with the MAC and NFS name spaces.
- ◆ CDROM supports High Sierra and ISO 9660 formats. It does not support HFS (Apple) file systems.

Additional Information

Topic	See
CD console commands	"CD" (page 24).
Administering CD-ROM volumes	"Using a CD-ROM as a NetWare Volume" in Chapter 7 of <i>Supervising the Network</i> .
Media commands	"MEDIA" (page 134).
Magazine commands	"MAGAZINE" (page 124).

CLEAR STATION

Purpose

Use at the server console to clear a workstation connection.



If you use CLEAR STATION while the workstation is in the middle of a transaction or a file update, files might be saved with incomplete data.

Syntax

CLEAR STATION *n*

Parameter	Use to
<i>n</i>	Specify the connection number of the workstation you want to clear from the server.

Using CLEAR STATION

- ◆ To determine the connection number, select “Connection Information” from the MONITOR screen or use NLIST.
- ◆ You can use CLEAR STATION either after a workstation has crashed and left files open on a server or before you need to down the server.
- ◆ CLEAR STATION closes the workstation files and erases the server’s internal tables for the station, including drive mappings not saved in the login script.
- ◆ The communication link between server and station is broken.

Additional Information

Topic	See
Removing server resources from a workstation	“Clearing a Workstation Connection” in Chapter 7 of <i>Supervising the Network</i> .

CLIB

Purpose

Load at the server console before loading a module that requires the CLIB routines and functions.



If a module requires CLIB and it is not loaded, the module will usually autoload CLIB.

Syntax

LOAD [path]CLIB

Parameter	Use to
<i>path</i>	Specify the path to CLIB.NLM if you moved it from the default directory.

Using CLIB

- ◆ Load CLIB before you load the module that uses it.
- ◆ If you receive an error message indicating that a third-party NetWare Loadable Module™ (NLM) program is not allowing low-priority processes to run, load the NLM using this option: (CLIB_OPT)/y. This option instructs the system to run lower-priority processes as well as higher-priority processes. The command syntax is:

LOAD *third-party NLM* (CLIB_OPT)/y

The parentheses are required.

- ◆ CLIB requires the STREAMS module. If you don't load STREAMS before CLIB, the operating system loads STREAMS for you. (See "STREAMS" on page 398.)

CLS

Purpose

Use at the server console to clear the console screen. (You can also use OFF to clear the screen.)

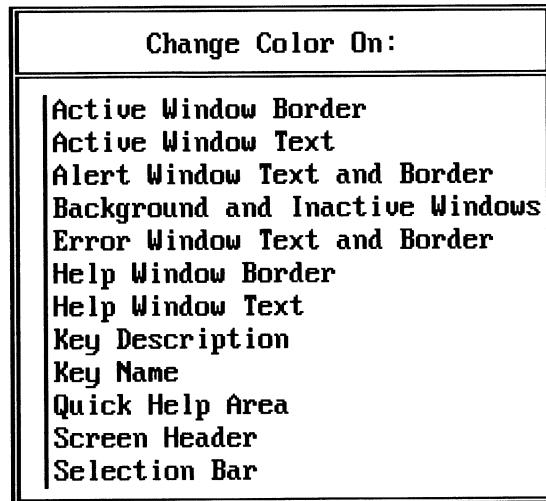
Syntax

CLS

COLORPAL

Purpose

Use at a workstation to change the color of menu elements. The following COLORPAL menu shows the elements you can change.



Syntax

COLORPAL [/VER]

Parameter	Use to
/VER	View the version number of the utility and the list of files it uses to execute.



Note For help with tasks, press <F1> in the utility.

Using COLORPAL

- ◆ Menu elements set with COLORPAL are saved to the IBM_RUN.OVL file. By default, the IBM_RUN.OVL file is in the SYS:PUBLIC directory.
- ◆ You must have the Write right to the IBM_RUN.OVL file. Therefore, a copy of the file must reside in the directory you run NetWare text utilities from (including the NMENU utility).
- ◆ The colors used by any NetWare text utility are determined by the copy of IBM_RUN.OVL found when the utility executes.
- ◆ You can have multiple copies of IBM_RUN.OVL in multiple directories. Each copy of the overlay file can have different menu element settings, providing different menus with varying color combinations.
- ◆ Unless you set your own color combinations with COLORPAL, the colors set by default, or by the network supervisor, will be the colors displayed by every NetWare text utility you open.

CONFIG

Purpose

Use at the server console to view the following:

- ◆ NetWare server name, internal network number, server uptime, and loaded LAN drivers
- ◆ Hardware settings, node (station) addresses, external network number of the cabling scheme, board name, frame type, and communication protocol for each network board
- ◆ The server's Directory tree and bindery context

Syntax

CONFIG

Using CONFIG

- ◆ Before installing memory boards, network boards, or host bus adapters, execute CONFIG to see a list of hardware settings already in use by LAN drivers.
- ◆ On some systems, CONFIG may also display information about NetWare Loadable Modules (NLMs). The kind and amount of NLM information depends on the system.

Additional Information

Topic	See
Internal network numbers	“Network numbering” in <i>Concepts</i> .
Network numbers for cabling	“Network numbering” in <i>Concepts</i> .
Node addresses	“Node number” in <i>Concepts</i> .
Loadable modules	“MODULES” (page 139) and “MONITOR” (page 141).
Configuration information for disk drivers	“Load the Disk and CD-ROM Drivers” in Chapter 2 of <i>Installation</i> “MONITOR” (page 141).
Network numbers in use by your server	“DISPLAY NETWORKS” (page 52).

CONLOG

Purpose

Use at the server console to

- ◆ Capture all console messages generated at the server while CONLOG is loaded
- ◆ Write the messages to the SYS:\ETC\CONSOLE.LOG default file (or to another file of your choice)

Syntax

```
LOAD CONLOG [FILE=log filename] [SAVE=backup
filename] [MAXIMUM=max file size] [ENTIRE=YES] |
HELP
```

Parameter	Use to
FILE=log filename	Specify the log file you want to use if you don't want CONLOG to write to the default log file (CONSOLE.LOG). The <i>log filename</i> parameter is used with SFT III servers, whose three engines must each write to a different log file.
SAVE=backup file name	Specify the filename in which you want to save the preexisting console log. This parameter enables AUTOEXEC.NCF to load CONLOG without overwriting the previous console log. Use this parameter if you want to examine the old console log for troubleshooting purposes.

Parameter	Use to
MAXIMUM= <i>max file size</i>	Specify the maximum size, in kilobytes, of the log file.
	If the log file exceeds the <i>max file size</i> , it is deleted—or renamed if <i>backup filename</i> was specified. In either case, logging starts over with an empty log file.
ENTIRE=YES	Capture the lines already on the screen at the time CONLOG is loaded.
	Without this parameter, CONLOG starts logging with the next output to the console after it is loaded.
HELP	View a description of each CONLOG command parameter.

Using CONLOG



- ◆ You can view the console log from the Internetworking Configuration utility (INETCFG) or with any text editor. Console messages can reveal errors that occur during system initialization.

Do not use EDIT to view the console log while INETCFG is loaded.

- ◆ The command LOAD CONLOG is typically added to the AUTOEXEC.NCF file, as in the following example:

```
FILE SERVER NAME NETW41_SVR
IPX INTERNAL NET C92556E
LOAD CONLOG
LOAD REMOTE
LOAD RSPX
```

Examples

- ◆ To start capturing console messages during system initialization, type

LOAD CONLOG

- ◆ To load CONLOG but save the current log file as CLOG.BAK and limit the size of CONSOLE.LOG to 100 KB, type

LOAD CONLOG SAVE=CLOG.BAK MAXIMUM=100

- ◆ To stop capturing console messages, type

UNLOAD CONLOG

Additional Information

Topic	See
INETCFG	“INETCFG” (page 95).

CX

Purpose

Use at a workstation to view or change your context, or to view containers and leaf objects in your tree structure.

Syntax

CX [*new context*] [/option...] [/? | /VER]

Parameter	To
(no parameter)	View the current context.
<i>new context</i>	Move to a new context or specify the context you want for an option.
/option	Replace <i>option</i> with any available option. See “CX Options.”
/?	View online help. All other parameters are ignored when /? is used.
/VER	View the version number of the utility and the list of files it uses to execute. All other parameters are ignored when /VER is used.

Using CX

- ◆ CX is similar to the DOS CD and DIR commands in that CX allows you to change contexts and view all objects below a given container.
- ◆ CX doesn't recognize spaces in object names. If you have spaces in container names, put quotation marks around the names or use underscores (_) in place of the spaces.

For example, for container CORPORATE ADMIN, type “Corporate Admin” or Corporate_Admin.

- ◆ You may need to use CX before logging in to set your context to the same value as the name context specified in your NET.CFG file.

CX Options

Option	Use to
/R	List containers at the root level, or change context in relation to the root.
/T	List containers below the current context or a specified context in a tree structure.
/CONT	List containers at the current context or a specified context in a vertical list with no structure.
/A	Include all objects at or below the context. Use with /T or /CONT.
/C	Scroll continuously through output.

Examples

- ◆ To see your context in the Directory before logging in, type

CX

- ◆ To set a new context from the root
 - ◆ Place a period in front of the new context you type, or
 - ◆ Enter the proper number of trailing periods to reach the root level, or
 - ◆ Use the /R option.

- ◆ To back up one level in the Directory tree, type

CX .

(You must put a space between the command and the trailing period.)

- ◆ To go down two levels from PROVO.NOVELL to SYSTEM.ENGINEERING. PROVO.NOVELL, type

CX SYSTEM.ENGINEERING

- ◆ To change your current context from TESTING. PROVO.NOVELL.US to SYSTEM.MARKETING. PROVO.NOVELL.US, type

CX .SYSTEM.MARKETING.PROVO.NOVELL.US

or

CX SYSTEM.MARKETING.

- ◆ To change to the root when your context is TEST.PROVO.NOVELL, type

CX . . .

or

CX /R

- ◆ To change the complete context from TESTING. PROVO.NOVELL to TESTING.PARIS.NOVELL, type

CX .TESTING.PARIS.NOVELL

- ◆ To show all containers in the current context, type

CX /CONT

- ◆ To show all containers in the context SALES.NOVELL in a tree structure, type

CX .SALES.NOVELL /T

- ◆ To show all containers and leaf objects in the current context in a tree structure, type

CX /T /A

Additional Information

Topic	See
Context	“Context” in <i>Concepts</i> .
Root object	“Root object” in <i>Concepts</i> .

DISABLE LOGIN

Purpose

Use at the server console to prevent users from logging in.

Syntax

DISABLE LOGIN

Using DISABLE LOGIN

- ◆ Use this command to prevent users from logging in when you are making repairs, backing up files, or loading software.
- ◆ Users already logged in aren't affected. However, a user who logs out can't log in again until you execute ENABLE LOGIN. (See "ENABLE LOGIN" on page 67.)

DISMOUNT

Purpose

Use at the server console to make a volume unavailable to users.

Syntax

DISMOUNT *volume name*

Parameter	Use to
<i>volume name</i>	Specify the name of the volume you want to dismount.

Using DISMOUNT

◆ DISMOUNT allows you to maintain or repair a volume and to upgrade disk drivers while the NetWare server is up.

◆ Use this command to unmount all volumes residing on a removable drive before you remove the drive.

◆ If you are running out of memory and can't add more RAM, consider dismounting a volume that isn't used often.

 Mounted volumes take up memory allocated for file caching and thus affect server performance.

◆ You can also use INSTALL to dismount a volume.

Additional Information

Topic	See
Dismounting a volume	"Mounting and Dismounting Volumes" in Chapter 7 of <i>Supervising the Network</i> .

DISPLAY NETWORKS

Purpose

Use at the server console to list all networks and assigned network numbers that the NetWare server's internal router recognizes.

Syntax

DISPLAY NETWORKS

Using DISPLAY NETWORKS

DISPLAY NETWORKS lists the IPX external network numbers of networks recognized by your server. The following example illustrates a portion of the command display:

0000000D 2/3	00000016	5/11	00000070	5/11
00000097 6/12	000000ED	5/6	000000F1	3/3
000000FF 2/2	00000101	6/11	00000111	5/11
000003E8 5/11	00000456	6/12	00000666	5/17

Each address is followed by two numbers separated by a slash. The first number is the number of hops between your server and the network at that address. The second number is the number of ticks (1/18th of a second) required to send a packet to that address.

Additional Information

Topic	See
Listing servers on the network	"DISPLAY SERVERS" (page 53).

DISPLAY SERVERS

Purpose

Use at the server console to view a list of all servers and services being advertised by Service Advertising Protocol (SAP) packets.

Syntax

DISPLAY SERVERS

Using DISPLAY SERVERS

- ◆ DISPLAY SERVERS lists server address names for services such as
 - File services
 - NetWare Directory Services (NDS)
 - Print services
 - Storage Management Services™ (SMS)
 - Services for Structured Query Language (SQL) servers

The following illustrates a line of a typical display:

00001B040064 3 00001B040CF4 3 00001B04303D 3

- ◆ The number listed after the server name indicates the number of hops between your server and the listed server. Your server is indicated by 0 hops.
- ◆ Servers more than 16 hops away aren't recognized.
- ◆ DISPLAY SERVERS also displays Directory trees and network addresses. A server can be displayed many times, once for each service that it advertises.

For example, all NetWare 4 servers are listed at least two times because they advertise file services and NetWare Directory Services.

Additional Information

Topic	See
Listing networks	"DISPLAY NETWORKS" (page 52).
Service advertising	"Service Advertising Protocol" in <i>Concepts</i> .

DOMAIN

Purpose

Use at the server console to

- ◆ Protect server memory by creating an OS domain and an OS_PROTECTED domain
- ◆ View the current domain and modules in the domain, change the current domain, or permit some misbehaved modules to be loaded

Note 

DOMAIN will not load on a NetWare for OS/2 server.

Syntax

To load DOMAIN, use the following command:

LOAD [path] DOMAIN [parameter]

Note 

DOMAIN.NLM must be loaded from your STARTUP.NCF file before you load other modules, and you must have the following files in your boot directory: DOMAIN.NLM, NWTLIL.NLM, NWTLILR.NLM, and DOMAIN.MSG.

Parameter	Use to
<i>path</i>	Specify the path to DOMAIN.NLM if you moved it from the default directory.

DOMAIN

Parameter	Use to
-E	Give misbehaved modules access to data that exists in the code segment in memory. (This parameter should be used only by advanced system administrators.) For details on using this parameter, see "Loading a Misbehaved NLM" in Chapter 7 of <i>Supervising the Network</i> . If you use this parameter, modules subsequently loaded in the OS_PROTECTED domain will use this method of memory management by allowing access to the code segment using the data segment register.

After you load DOMAIN, the following commands are valid:

DOMAIN [parameter]

Parameter	Use to
(no parameter)	View the current domain and the modules in the domain, followed by other domains and their modules.
<i>help</i>	View online help.
<i>domain name</i>	Change the current domain. Replace <i>domain name</i> with the name of the domain you want to be the current domain (OS or OS_PROTECTED).
Note: The current domain is where the loader places a module.	

Using DOMAIN

- ◆ The OS and OS_PROTECTED domains are created when you load DOMAIN.
- ◆ When you load DOMAIN, the following files are also loaded: NWTL.NLM and NWTLR.NLM.

To reclaim memory, unload NWTL once your server is up and all your modules are loaded. NWTL is only used while modules are being loaded.

- ◆ If you have an NLM that is not certified by Novell®, you might want to load it in the OS_PROTECTED domain. Then, after it has proven reliable, it can be run in the OS domain.
- ◆ A related command provides an alternate method for loading a misbehaved NLM by placing the NLM code in the data segment. The command syntax is:

LOAD -L nlm_name

Unlike the -E parameter used with the LOAD DOMAIN command, this method affects memory management only for the NLM you load with the parameter.

For more information, see “Loading a Misbehaved NLM” in Chapter 7 of *Supervising the Network* and “LOAD” (page 114).

Examples

Load a Third-Party Module

To load EXAMPLE.NLM (a third-party module) and give it access to data that exists in the code segment in memory:

Procedure 

1. In STARTUP.NCF, type

```
LOAD DOMAIN -E
```

2. Reboot the server.

3. At the server console, type

```
DOMAIN=OS_PROTECTED
```

```
LOAD EXAMPLE
```

Load EDIT in a Protected Domain

Procedure 

1. In STARTUP.NCF, type

```
LOAD DOMAIN
```

2. Reboot the server.

3. At the server console, type

```
DOMAIN=OS_PROTECTED
```

```
LOAD EDIT
```

Additional Information

Topic	See
Protecting a server's OS memory	"Protecting the Operating System's Memory" in Chapter 7 of <i>Supervising the Network</i> .
Loading misbehaved modules	"Loading a Misbehaved NLM" in Chapter 7 of <i>Supervising the Network</i> .
Domains	"Domains" in <i>Concepts</i> .
Memory protection	"Memory protection" in <i>Concepts</i> .
	"Paging" in <i>Concepts</i> .

DOSGEN

Purpose

Use at a workstation to boot a DOS workstation from remote boot image files on the server (rather than booting from a local drive).

Syntax

DOSGEN [/? | /VER]



You must first load RPL on the server and bind it to the network board. See "Setting Up RPL Support" in Chapter 6 of the *NetWare Client for DOS and MS Windows User Guide*.

Parameter	Use to
/?	View online help.
/VER	View the version number of the utility and the list of files it uses to execute.

Additional Information

Topic	See
Creating remote boot image files.	"Creating Remote Boot Disk Image Files" in Chapter 6 of <i>NetWare Client for DOS and MS Windows User Guide</i> .

DOWN

Purpose

Use at the server console to ensure data integrity before turning off power to the NetWare server.

Syntax

DOWN

Using DOWN

- ◆ DOWN ensures data integrity by writing cache buffers to disk, closing files, and updating Directory tables and File Allocation Tables.
- ◆ Changes held in cache buffers are lost if you turn off power without using DOWN first.

Additional Information

Topic	See
Downing the NetWare server	“Bringing Down a Server” in Chapter 7 of <i>Supervising the Network</i> .
Restarting the server	“RESTART SERVER” (page 260).

DSMERGE

Purpose

Use at the server console to

- ◆ Merge the roots of two separate NetWare Directory Services (NDS) trees
- ◆ Rename a tree to verify that all servers in the tree are responding properly and have the same tree name
- ◆ View time synchronization information and display the time server for all servers in the tree

Syntax

LOAD [path]DSMERGE

Parameter	Use to
<i>path</i>	Specify the path to DSMERGE.NLM if you moved it from the default directory of SYS:SYSTEM.

Additional Information

Topic	See
Configuring time synchronization	“Managing Network Time Synchronization” in Chapter 7 of <i>Supervising the Network</i>
Merging partitions	“Merging Partitions” in Chapter 5 of <i>Supervising the Network</i>
Moving leaf objects	“Moving Objects in the Directory Tree” in Chapter 5 of <i>Supervising the Network</i>
Using DSMERGE	“Merging NDS Trees” in Chapter 5 of <i>Supervising the Network</i>

DSREPAIR

Purpose

Use at the server console to repair and correct problems in the NetWare Directory Services database, such as records, schema, bindery objects, and external references.

Syntax

```
LOAD [path] DSREPAIR [-U]
```

Option	Use to
<i>path</i>	Specify the path to DSREPAIR.NLM if you moved it from the default directory.
-U	Instruct DSREPAIR to run and exit, and then unload from memory, without further user assistance.

Additional Information

Topic	Reference
Using DSREPAIR	"Repairing the NetWare Directory Database" in Chapter 5 of <i>Supervising the Network</i> .

EDIT

Purpose

Use at the server console to create or modify a text file on either a DOS or NetWare partition.

Syntax

LOAD [path]EDIT [file.pathname]

Parameter	Use to
<i>path</i>	Specify the path to EDIT.NLM if you moved it from the default directory.
<i>file.pathname</i>	Specify the pathname of the file you want to edit.

Using EDIT

- ◆ If you do not enter a file pathname when you load EDIT, EDIT prompts you for the filename.
- ◆ If the file doesn't exist, EDIT displays a prompt asking if the file should be created.
- ◆ When you create a new file, the file can be no larger than 8 KB. Each time you open the file after that, you can increase the file size by up to 4 KB.
- ◆ You can use EDIT to view read-only files.
- ◆ EDIT is particularly useful for creating .NCF batch files that automatically execute server commands.

Additional Information

Topic	See
Editing or creating text files	“Editing Text Files from the Server Console” in Chapter 7 of <i>Supervising the Network</i> .

ENABLE LOGIN

Purpose

Use at the server console to reenable the login function or to enable the administrator's account when the account has been locked by the intruder detection function.

Syntax

ENABLE LOGIN

Using ENABLE LOGIN

You don't need to use ENABLE LOGIN when you boot the NetWare server. The login function is enabled during the boot process.

ENABLE TTS

Purpose

Use at the server console to start the Transaction Tracking System™ (TTS) in the network server.

Syntax

ENABLE TTS

Using TTS

Normally, TTS™ is enabled. Use ENABLE TTS only if the TTS has been disabled, automatically or manually.



Do not ever disable TTS intentionally because this will prevent updates to the NetWare Directory Services replicas on the server.

Additional Information

Topic	See
Enabling TTS	“Protecting Database Integrity with TTS” in Chapter 7 of <i>Supervising the Network</i> .
TTS description	“Transaction Tracking System” in <i>Concepts</i> .
TTS\$LOG.ERR file	“Keeping a Log of Backed-Out Data” in Chapter 7 of <i>Supervising the Network</i> .

EXIT

Purpose

Use at the server console to return to DOS after you down a network server.

Syntax

EXIT

Using EXIT



Note You must use the DOWN command to down the server before using EXIT.

- ◆ EXIT allows you to access DOS files or to rerun SERVER.EXE with new parameters.
- ◆ If you have removed DOS from the server, using EXIT reboots the server.

Additional Information

Topic	See
Returning to DOS after downing the server	"Bringing Down a Server" in Chapter 7 of <i>Supervising the Network</i> .
Restarting the server without rebooting it	"RESTART SERVER" (page 260).
Bringing down the server	"DOWN" (page 61).
Warm booting the server with EXIT	"REMOVE DOS" (page 254).

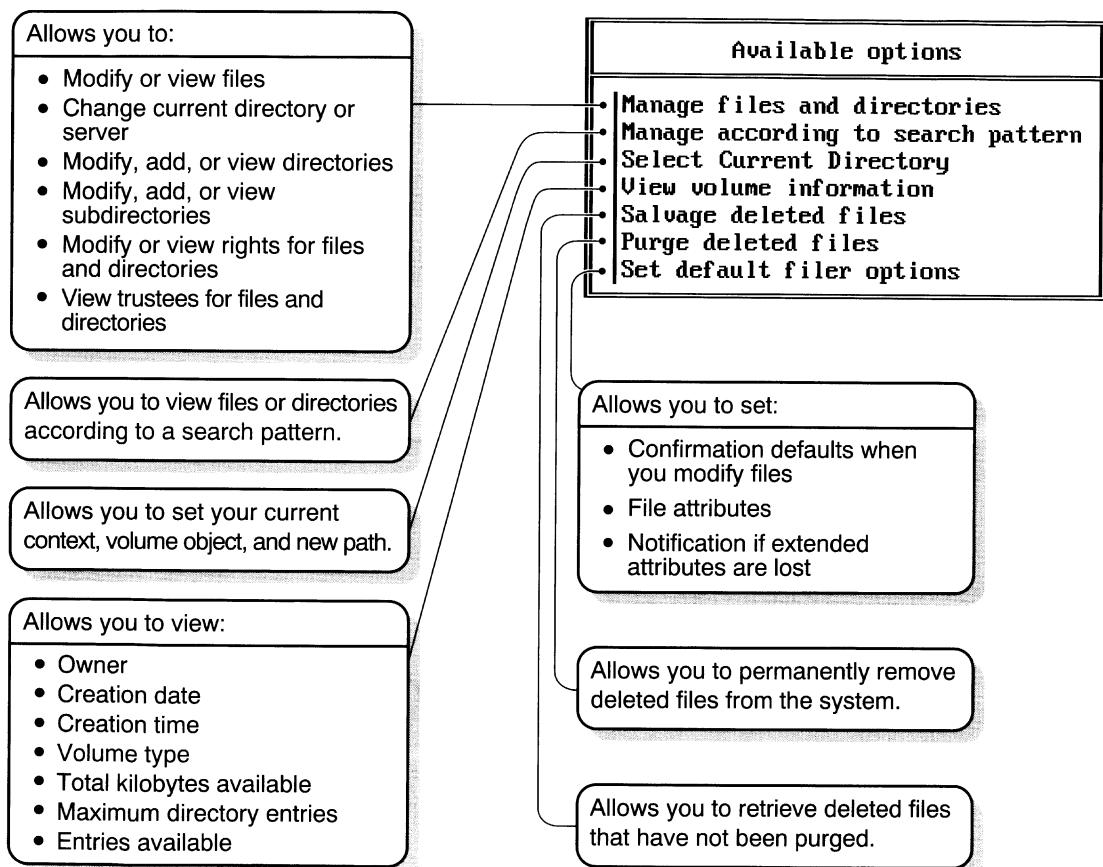
FILER

Purpose

Use at a workstation to manage files and directories. FILER works with the file system; it doesn't affect NetWare Directory Services objects.

The Figure 2-3 shows the functions of FILER.

Figure 2-3
FILER Functions



Syntax

FILER [/VER]

Parameter	Use to
/VER	View the version number of the utility and the list of files it uses to execute.



For help with tasks, press <F1> while you are in the utility.

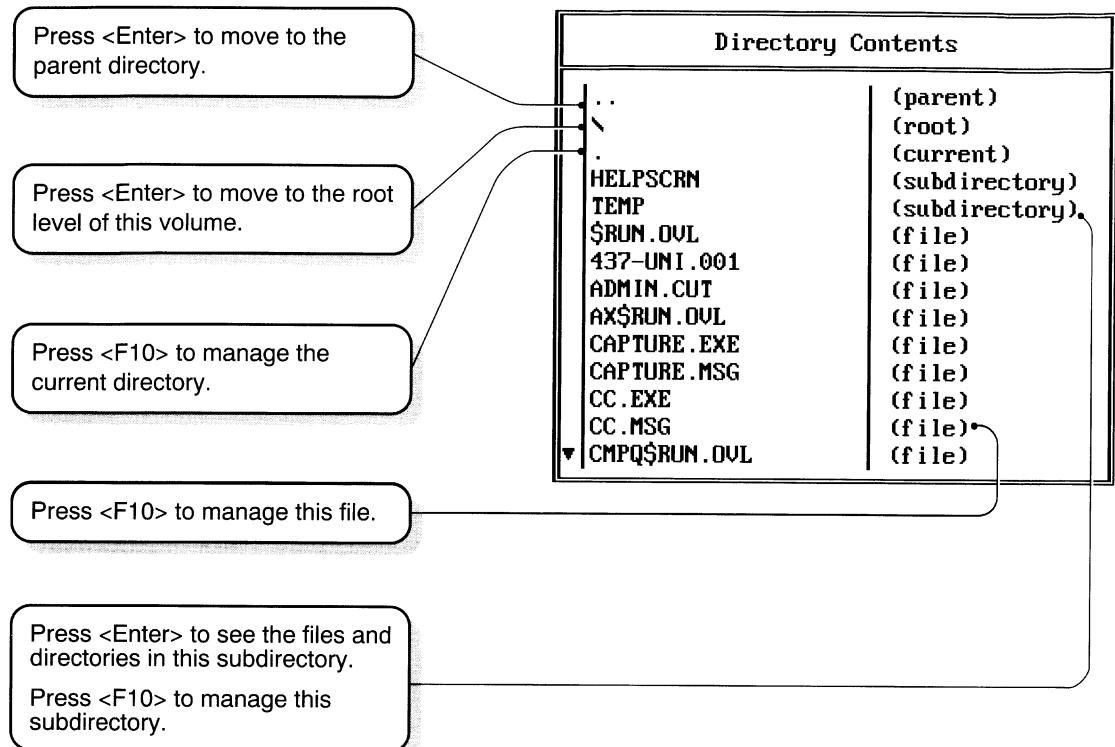
Using FILER

This section describes features of FILER and explains how to use them.

Using the Browse Screen

By selecting different items in a list, you can either view or edit an item, or you can select a different level of the directory structure to view or edit. Figure 2-4 shows the main tasks you can perform from the browse screen.

Figure 2-4
The Browse Screen



Managing File or Directory Information

Each file and directory can be managed separately. Figure 2-5 displays the various areas you can view or edit.

Figure 2-5
File Information

File Information for ADMIN.CUT	
Attributes: [Rw--A]	Status: ---
Owner: CN=Admin.O=NOVELL	
Inherited Rights Filter: [SRWCEMFA]	
Trustees: ↓ <empty>	
Current effective rights: [SRWCEMFA]	
Owning name space: DOS	
File size: 938 bytes	
EA Size: 0 bytes	
Creation date: 9-2-1992	
Last accessed date: 9-2-1992	
Last archived date: (Not Archived)	
Last modified date: 9-2-1992	

This shows DOS attributes.

This shows NetWare attributes.

This shows whether the file has been compressed or migrated.

The arrow indicates that there can be more than one item for this field.
Press <Enter> on this field to view the list.

Restoring Deleted Files or Directories

To restore deleted files and directories, from the initial menu choose "Salvage Deleted Files." You can restore only those files you have the Create right for.

Examples

Modify File or Directory Attributes

Procedure 

1. Select “Manage Files and Directories.”
2. Highlight the file or directory whose attributes you want to modify. Press **<F10>**.
3. Select “View/Set File (Directory) Information.”
4. Press **<Enter>** on “Attributes.”
5. Press **<F1>** for help from here.

View Volume Information

Procedure 

1. Select “Select Current Directory.”
2. Highlight the volume whose information you want to view. Press **<F10>**.
3. Select “View volume information.”
4. Press **<F1>** for help from here.

View File or Directory Effective Rights

Procedure 

1. Select “Manage files and directories.”
2. Highlight the file or directory whose effective rights you want to view. Press **<F10>**.
3. Select “View/Set File (Directory) Information.”
4. Find “Current Effective Rights” on the form.
5. Press **<F1>** for help from here.

Copy a File or All Files in a Directory

Procedure 

1. Select “Manage files and directories.”
2. Highlight the file or directory whose effective rights you want to view. Press <F10>.
3. Select “View/Set File (Directory) Information.”
4. Find “Current Effective Rights” on the form.
5. Press <F1> for help from here.

Purge Deleted Files

Procedure 

1. Type FILER.
2. Select “Purge deleted files.”
3. Press <F1> for help from here.

Salvage Deleted Files

Procedure 

1. Type FILER.
2. Select “Salvage deleted files.”
3. Press <F1> for help from here.

Additional Information

Topic	See
Directory attributes	“Attributes” in <i>Concepts</i> .
File attributes	“Attributes” in <i>Concepts</i> .
Hidden attribute	“Attributes” in <i>Concepts</i> .

FILTCFG

Purpose

Use at the server console to set up and configure filters for IPX, TCP/IP, and AppleTalk protocols.

Syntax

LOAD FILTCFG

Using FILTCFG

Filters help you control what kind of information is sent and received by a router by selectively discarding packets of specified types.

Filters help you to limit specific kinds of traffic to a certain part of your network, or to provide security.

NetWare 4.1 provides the following filter types:

- ◆ Packet forwarding
- ◆ Service information
- ◆ Routing information

The following table shows filtering support for protocols:

Protocol	Packet Forwarding Filter	Service Information Filter	Routing Information Filter
IPX	X	X	X
AppleTalk		X	X
TCP/IP	X		X

Packet Forwarding Filters

Packet forwarding filters restrict access to services by filtering data packets sent by the restricted location to the service location.

Because these filters don't restrict Service Advertising Protocol (SAP) packets sent by servers, restricted users might see advertisements of services even when they cannot access the service.

Although these filters provide the highest level of security of all the filters, they might affect the performance of the router because the filters are applied to each data packet the router receives.

Service Information Filters

Service information filters restrict service advertisement on a router's internetwork.

This type of filtering provides low-level security by preventing users from finding the network addresses of services.

It also reduces the network bandwidth consumed by periodic service broadcasts.

Service information filters are of two types:

- ◆ Service advertisement filters limit the service advertisements sent by a router for a specified set of services to a specified set of networks.
- ◆ Service acceptance filters limit the acceptance of service advertisements received by the router for a specified set of services at a specified set of networks. (By filtering what a router sees, you are restricting the set of services that are advertised by the router on any other interface.)

Routing Information Filters

Routing information filters restrict the exchange of routing information between routers by limiting the routes added to the routing tables of specified routers.

These filters increase network security by limiting the visibility of specified networks. They also reduce the bandwidth used by the periodic exchange of routing information between routers.

Routing information filters are of two types:

- ◆ Route advertisement
- ◆ Route acceptance

When you add a routing information filter, an implicit server filter is also added for all services residing on the filtered networks.

Additional Information

Topic	See
IPX protocol	<i>NetWare IPX Reference.</i>
IP protocol	<i>NetWare TCP/IP Reference.</i>
AppleTalk protocol	<i>NetWare AppleTalk Reference.</i>

FLAG

Purpose

Use at a workstation to

- ◆ View or modify file and directory attributes to determine which operations can be performed with the file or directory
- ◆ Modify the owner of a file or directory
- ◆ View or modify the search mode of executable files to determine how the program uses search drives when looking for a file

Syntax

FLAG *path* [[+ | -] *attribute...*] [/option...]
[/? | /VER]

Parameter	Use to
(no parameter)	If you type FLAG with no parameters, the attribute status of all the files in the current directory appears.
<i>path</i>	Specify the path to the file or directory whose attributes or search modes you want to modify.
+ -	Add attributes to a file or directory with the + (plus).
	Remove attributes from a file or directory with the - (minus).
	If neither + nor - is used, the attributes will be assigned to the file/directory as specified.
	If you add and remove attributes in the same command, group all + (plus) attributes together and all - (minus) attributes together.

Parameter	Use to
<i>attribute</i>	Specify one or more file or directory attributes. See “Directory Attributes” on page 81 and “File Attributes” on page 82.
<i>/option</i>	Replace <i>option</i> with any available option. See “General FLAG Options” on page 81.
<i>/?</i>	View online help. All other parameters are ignored when <i>/?</i> is used.
<i>/VER</i>	View the version number of the utility and the list of files it uses to execute. All other parameters are ignored when <i>/VER</i> is used.



For help with tasks, press <F1> in the utility.

Using FLAG

- ◆ Use FLAG options to add or delete directory and file attributes, as defined in the preceding parameters table.

For attributes that can be applied to directories, see “Directory Attributes” on page 81.

For attributes that can be applied to files, see “File Attributes” on page 82.

- ◆ When you add or delete multiple attributes, include a space between attribute abbreviations.
- ◆ You can’t remove the Execute Only attribute. You must delete the file and then reinstall it.
- ◆ You can use wildcard characters.

General FLAG Options

Option	Use to
/NAME GROUP = <i>name</i>	Change the owner of a file or directory.
/D	View details about a file or directory.
/DO	View or modify only directories in the specified path.
/FO	View or modify only files in the specified path.
/OWNER= <i>name</i>	View all files or directories owned by a user.
/M= <i>mode</i>	Modify search modes of executable files. See “Search Modes for Executable Files” on page 84.
/S	Search the subdirectory in the specified path and any subdirectories below that level.
/C	Scroll continuously through output.

Directory Attributes

Option	Use to
ALL	Specify the Di, H, Ic, P, Ri, and Sy attributes as a group. Primarily used to assign directories these specific attributes.
Di (Delete Inhibit)	Prevent the directory from being deleted.
Dc (Don’t Compress)	Prevent the directory from being compressed (regardless of what the volume is set to).
Dm (Don’t Migrate)	Prevent the directory from being migrated to a secondary backup system (regardless of what the volume is set to).
H (Hidden)	Prevent the directory from being seen with a DOS DIR command.

FLAG

Option	Use to
Ic (Immediate Compress)	Compress the directory as soon as the OS can.
N (Normal)	Specify no attributes.
P (Purge)	Purge the directory immediately when the directory is deleted.
Ri (Rename Inhibit)	Prevent the directory from being renamed.
Sy (System)	Prevent the directory from being seen with a DOS DIR command; also to prevent it from being copied or deleted.

File Attributes

Option	Use to
ALL	Specify the A, Ci, Di, H, Ic, P, Ri, Ro, Sh, Sy and T attributes as a group. Primarily used to assign files these specific attributes.
A (Archive needed)	Indicate that the file has been modified since the last backup.
Ci (Copy Inhibit)	Prevent files from being copied. (Only for MAC files.)
Dc (Don't Compress)	Prevent a file from being compressed (regardless of what the volume or directory is set to).
Di (Delete Inhibit)	Prevent a file from being deleted or copied over.
Dm (Don't Migrate)	Prevent a file from being migrated to a secondary backup system (regardless of what the volume or directory is set to).

Option	Use to
Ds (Don't Suballocate)	Prevent an individual file from being suballocated, even if suballocation is enabled for the system. Use on files which are enlarged or appended to frequently, such as certain database files.
H (Hidden)	Prevent a filename from being displayed with the DOS DIR command. The file can't be copied or deleted.
Ic (Immediate compress)	Compress a file as soon as the OS can.
N (Normal)	Specify the Rw attribute.
P (Purge)	Purge a file immediately if the file is deleted.
Ri (Rename Inhibit)	Prevent a file from being renamed.
Ro (Read Only)	Allow a file to only be read; it can't be written to or deleted (in other words, Ro includes Ri and Di).
Rw (Read Write)	Allow a file to be read and written to.
Sh (Shareable)	Allow a file to be used by several users simultaneously.
Sy (System)	Prevent a filename from being displayed with the DOS DIR command. It can't be copied or deleted.
T (Transactional)	Protect a file by using the Transaction Tracking System.
X (Execute Only)	Prevent a file from being copied or copied over. This attribute can be given only to .EXE or .COM files, <i>and cannot be removed</i> .

Search Modes for Executable Files



The syntax is `/M=mode`. Replace *mode* with a mode number from the following table.

Mode	Use to
0	Search for instructions in the NET.CFG file (the default mode).
1	Search the path specified in the file. If there is no path, the file searches the default directory, and then all search drives.
2	Search the path specified in the file. If there is no path, the file searches only the default directory.
3	Search the path specified in the file. If there is no path, the file searches the default directory; then if the open request is read only, the file searches the search drives.
4	Reserved; don't use.
5	First search the path specified and then all search drives. If there is no path, the file searches the default directory and then all search drives.
6	Reserved; don't use.
7	First search the path specified. If the open request is read only, the file searches the search drives. If there is no path, the file searches the default directory and then all search drives.

Status Flags



Status flags show attribute information for a file or directory. You can't change these flags.

Status	Indicates
Cc (Can't Compress)	The file can't be compressed because of limited space savings.
Co (Compressed)	The file has been compressed.
M (Migrated)	The file has been migrated.

Examples

- ◆ To add Rw and Ic and remove Di and A from all files in the current directory, type

FLAG *.* +R W Ic -Di A

- ◆ To view attributes for file STUDENTS in directory SYS:\COURSE\WINTER, type

FLAG SYS:\COURSE\WINTER\STUDENTS

- ◆ To give files in drive G: the Hidden attribute, type

FLAG G:.* H /FO

- ◆ To set the search mode to 7 for all executable files in the current directory, type

FLAG *.* /M=7

- ◆ To set the search mode to 1 and assign all files in the current directory the Read Write attribute, type

FLAG *.* RW /M=1

Additional Information

Topic	See
Search modes	“Search modes” in <i>Concepts</i> .
Directory attributes	“Attributes” in <i>Concepts</i> .
File attributes	“Attributes” in <i>Concepts</i> .
System directory	“Attributes” in <i>Concepts</i> .
Hidden attribute	“Attributes” in <i>Concepts</i> .
File compression	“Enabling File Compression on a Volume” in Chapter 7 of <i>Supervising the Network</i> .

HALT

Purpose

Use at a NetWare 4.1 SFT III server console to bring down an IOEngine on one SFT III server while leaving the other IOEngine running.

Syntax

HALT

Using HALT

- ◆ HALT is valid only when SFT III servers are mirrored (or before SFT III servers are activated).
- ◆ Execute HALT from the appropriate IOEngine, not from the MSEngine. If you execute HALT from the MSEngine, you receive an “unknown command” error.
- ◆ When the primary IOEngine is brought down using HALT, the secondary server automatically takes over as the new primary server. When the secondary IOEngine is brought down using HALT, the primary server continues running.

Warning



Disks should be mirrored before you halt the primary IOEngine. If the disks aren't mirrored when you execute HALT, a warning similar to the following appears:

WARNING!!! Not every disk is remirrored. Answering yes may cause some volumes to dismount and open files to be lost.

Are you sure you wish to halt the primary server?

HCSS

Purpose

Use at the server console to

- ◆ View a listing of High Capacity Storage System (HCSS) commands and current settings
- ◆ Change current HCSS settings



You can also use NetWare Administrator to change HCSS parameter settings.

Syntax

HCSS [*parameter*] = [*setting*]



The HCSS parameters are case sensitive and must be entered exactly as they appear in the following table.



Parameter settings marked with an asterisk are persistent; that is, they are saved in memory for the next time HCSS is loaded. The nonpersistent parameter settings reset to the default every time HCSS is loaded.

Parameter	Explanation
(no parameter or setting)	Allows you to view a list of HCSS parameters and current settings.
Eject Media Override = <i>setting</i>	Stops media in the jukebox from being ejected. Supported settings: ON, OFF. Default: OFF

Parameter	Explanation
Delete Through = <i>setting</i>	Determines the method of file-deletion notification. When turned off, expedites the delete request, placing requested file deletions in a delete queue. When turned on, notifies you that the deletion was successful only when the deletion is complete through to the media. (This method provides higher security.)
	Supported settings: ON, OFF. Default: OFF
Migrate Unarchived Files = <i>setting</i>	Specifies whether unarchived files are migrated.
	Supported settings: ON, OFF. Default: OFF
MigrateCompressed Files Only = <i>setting</i>	Specifies if only compressed files or files that can't be compressed are migrated.
	Supported settings: ON, OFF. Default: OFF
Minimum Time In Drive = <i>setting</i>	Sets the minimum amount of time (in seconds) a side of media can remain active before it is switched for another side of media.
	This value includes the amount of time it takes for the jukebox to move the media into place.
	Supported settings: 0 to 3600. Default: 20.
Maximum Time In Drive= <i>setting</i>	Sets the maximum amount of time (in seconds) that a side of media can remain active before it is switched for another side of media.
	Supported settings: 0 to 3600. Default: 30.

Parameter	Explanation
Request Idle Time = <i>setting</i>	Sets the grace period that HCSS waits before removing one side of media from the drive to load another requested side of media. The period begins when the Minimum Time In Drive time expires.
	Supported settings: Any fraction of the difference between the Maximum Time in Drive and the Minimum Time In Drive settings.
	Default: 2.
Migration = <i>setting</i>	Enables or disables migration.
	Supported settings: ON, OFF (ON=migration disabled).
	Default: ON.
Upper Threshold = <i>setting</i> *	Sets the upper threshold (as a percentage of total volume space) that can be reached before files begin migrating to magneto-optical disc.
	For example, if this command is set at 70, migration begins when the volume has 30% free volume space remaining.
	Supported settings: 1 to 100.*
	Default: 80.
Lower Threshold = <i>setting</i> *	Sets the lower threshold (as a percentage of total volume space) at which files stop migrating to magneto-optical disc.
	Supported settings: 0 to 99.*
	Default: 50.

Parameter	Explanation
Migrate to Lower Threshold Hour = <i>setting</i> *	Sets the hour when files begin migrating automatically, whether or not the upper threshold is reached. Setting the migration time to exactly 0 (the equivalent of 12:00 a.m.) disables the migration time. Files will not be migrated automatically to the lower threshold once a day. Supported settings: 0 to 23.* Default: 3.
Migrate to Lower Threshold Minute = <i>setting</i> *	Sets the minute of the hour when files begin migrating automatically, whether or not the upper threshold is reached. Setting the migration time to exactly 0 (the equivalent of 12:00 a.m.) disables the migration time. Files will not be migrated automatically to the lower threshold once a day. Supported settings: 0 to 59.* Default: 0.
Remaining Capacity Before Warning = <i>setting</i>	Sets (as a percentage of free space remaining) when you want to be alerted about the volume's remaining capacity. For example, if you set this command to 30, you will be alerted that the volume is getting full when there is 30% of its free space remaining. Supported settings: 10 to 100. Default: 20.

Parameter	Explanation
Polling Frequency = <i>setting</i> *	Sets how often (in minutes) you want HCSS to check the thresholds you have set. If the threshold has been met or exceeded during this time interval, migration will begin automatically. Supported settings: 1 to 34560.* Default: 1.
Marking Frequency = <i>setting</i> *	Sets how often (in minutes) you want to build a list of least recently used (LRU) directories that are managed by HCSS. Supported settings: 1 to 34560.* Default: 30.
Warning Frequency = <i>setting</i>	Sets how often (in minutes) you want to be warned that the volume has exceeded its upper capacity threshold. Supported settings: 1 to 34560.* Default: 2.
Marked Files Limit = <i>setting</i>	Limits the number of migratable files that are scanned for the LRU lists with any setting other than zero (0). When this is set to zero (0), it means there is no limit; every migratable file in the HCSS domain is scanned—even if it is already migrated—and it goes on the LRU list. Supported settings: The total number of files flagged for migration, or any number smaller than the total. Default: 0 (no limit).

Additional Information

Topic	See
HCSS command parameters	“Managing HCSS Parameters” in Chapter 6 of <i>Supervising the Network</i> .
HCSS concepts	“High Capacity Storage System” in <i>Concepts</i> .

HELP

HELP

Purpose

Use at the server console to view the syntax, a brief description, and an example of a console command.

Syntax

HELP [*console command*] [**ALL**]

Parameter	Use to
(no parameter)	View a list of all console commands.
<i>console command</i>	Specify the name of the console command you want to view help for.
ALL	View a short description of each console command.
	Press <Enter> after each description to view the next description. Press <Esc> to exit.

Examples

- ◆ To view help for SEND, type

HELP SEND

- ◆ To view a description of each command, type

HELP ALL

INETCFG

Purpose

Use at the server console to set up and customize your internetworking configuration for IPX, IP, and AppleTalk.

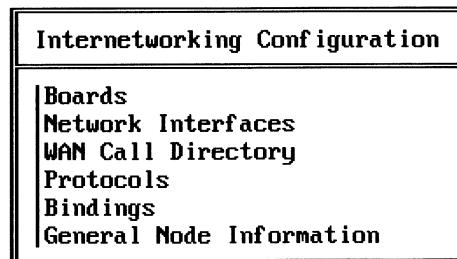
INETCFG simplifies the process of configuring local area networks (LANs) to work with network and routing protocols supported by NetWare.

Syntax

LOAD INETCFG

Using INETCFG

When you load INETCFG, the “Internetworking Configuration” menu appears, as shown in the following figure. You access INETCFG features from this menu.



Menu options are:

Option	Use to
Boards	Select and configure boards. To configure a board, you choose a driver, assign a name to the board, and specify values for the board parameters.
	Each driver that is compatible with NetWare has a driver description file, sometimes called the LDI file. The LDI file defines the parameters necessary for the driver to operate with the board you select. It also specifies the valid range of values for each parameter.
	If a driver has an LDI file, the parameters are presented in the "Board Configuration" window; you simply choose a value for each parameter.
	If a driver has no LDI file, you must enter the values yourself in the "Board Parameters" field.
Network Interfaces	Applies only to Wide Area Network (WAN) configurations for multiple interface WAN boards. (NetWare does not support WANs.)
WAN Call Directory	Applies only to WAN configurations. (NetWare does not support WANs.)
Protocols	Select and configure network protocols. To configure a protocol, you select the protocol, such as IPX or IP, and configure the protocol-specific parameters that pertain to routing, packet forwarding, etc.
Bindings	<ul style="list-style-type: none"> ◆ Bind a network protocol to an interface. ◆ Configure protocol and interface-specific parameters, such as frame type, network number (for IPX), local IP address (for IP), and zone information (for AppleTalk). ◆ Delete a bound interface from the configuration.

Option	Use to
Manage Configuration	Specify Simple Network Management Protocol (SNMP) information, such as the SNMP device name, hardware description, physical location, and human contact for the server or router.
View Configuration	<ul style="list-style-type: none"> ◆ View the INETCFG configuration information file and the console messages captured during system initialization. ◆ Import or export configuration information to or from a diskette.

INETCFG records information in various configuration (.CFG) files located in SYS:\ETC. Some of these files are present at system startup; others are created by INETCFG, depending on what you configure. Here is a partial list of these files:

- ◆ AURP.CFG
- ◆ TCPIP.CFG
- ◆ IPXSPX.CFG
- ◆ NLSP.CFG
- ◆ NETINFO.CFG



INETCFG creates these files strictly for its own use; do not delete them or change their contents.

Additional Information

Topic	See
AUTOEXEC.NCF file	"AUTOEXEC.NCF" in <i>Concepts</i> .
IPX	<i>NetWare IPX Reference</i> .
IP	<i>NetWare TCP/IP Reference</i> .
AppleTalk	<i>NetWare AppleTalk Reference</i> .
Capturing console messages	"CONLOG" (page 43).

INITIALIZE SYSTEM

Purpose

Use at the server console to enable the multiprotocol router configuration by executing all commands in the system NETINFO.CFG file.

Syntax

INITIALIZE SYSTEM

Using INITIALIZE SYSTEM

This command is typically executed from the INITSYS.NCF file during server startup.



Executing INITIALIZE SYSTEM on a system that has already been initialized can generate errors when the system discovers that the commands in the NETINFO.CFG file have already been executed.

Additional Information

Topic	See
Server startup	“ SERVER ” (page 293).

INSTALL

INSTALL

Purpose

Use at the server console to

- ◆ Install or upgrade the NetWare operating system on your server
- ◆ Modify your NetWare server's configuration
- ◆ Perform some server maintenance operations

Syntax

LOAD [path] INSTALL

Parameter	Use to
<i>path</i>	Specify the path to INSTALL if you moved it from the default directory.

Additional Information

Topic	See
Installing NetWare	<i>Installation.</i>
Upgrading a NetWare server	<i>Upgrade and Migration.</i>

IPXCON

Purpose

Use at the server console to

- ◆ Monitor and troubleshoot IPX routers and network segments throughout your IPX internetwork
- ◆ View the status of an IPX router or network segment
- ◆ View all paths through which IPX packets can flow
- ◆ Locate all active IPX routers on your internetwork
- ◆ Monitor remote IPX routers that are running NetWare IPX Router software

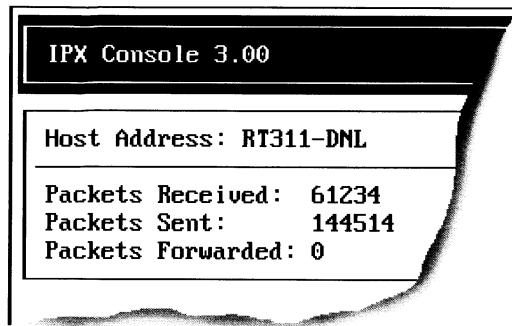
Syntax

LOAD IPXCON [/P]

Parameter	Use to
/P	View the Link State Packets (LSPs) received by the router, if the remote router is running NetWare Link Services Protocol™ (NLS).

Using IPXCON

When you load IPXCON, the top of the screen displays a summary of routing statistics for the selected router. (The following figure shows a partial display of routing statistics.) The bottom of the screen displays an “Available Options” menu.



The following table explains the fields in the summary display. Because IPXCON is a real-time monitor, these fields are always active, and some values in the fields change as the router processes IPX packets.

Field	Explanation
Host Address	Name of the router being monitored.
Packets Received	Number of IPX packets received by the selected router.
Packets Sent	Number of IPX packets sent by the selected router.
Packets Forwarded	Number of IPX packets forwarded by the selected router.
Circuits	Number of circuits in use on the router. A circuit is a logical attachment to a network segment through which a router can reach other systems. A circuit can be a local or wide area connection.
Networks	Number of networks known to the selected router.
Services	Number of services that can be reached from the selected router.

The “Available Options” menu allows access to additional features of IPXCON. These features are described in the following table.

Option	Use to
SNMP Access Configuration	Select the server you want to monitor.
	You can monitor the local system, which is the default, or a remote system.
	You can monitor the remote system through IPX or TCP/IP.
	You can also set the poll interval to specify how often the information will be retrieved through SNMP.
IPX Information	View statistics for the selected router's IPX packet routing.
	To display additional packet routing statistics, select “Detailed IPX Information” from the bottom of the “IPX Information” window.
IPX Router Information	View general information about the selected IPX router.
NLSP Information	View the following NLSP™ information about the selected router:
	System information Area addresses Neighbors Routers LANs LSPs
	To view the Link State Packets (LSPs) received by the system, load IPXCON by typing
	LOAD IPXCON /P
	The LSP option is enabled only if the server is running NLSP.

Option	Use to
Circuits	View circuit information.
Forwarding	View the Forwarding table.
Services	View information for the currently reachable services.

- ◆ IPXCON uses Simple Network Management Protocol (SNMP) to exchange management information and operational statistics with remote IPX routers.
- ◆ IPXCON operates over both IPX and TCP/IP networks.
- ◆ To execute IPXCON automatically each time you boot the server, add the LOAD IPXCON command after the INITSYS.NCF line in your AUTOEXEC.NCF file.

Additional Information

Topic	See
NLSP	<i>NetWare IPX Reference.</i>

IPXPING

Purpose

Use at the server console to check connectivity to an IPX server on your internetwork.

Syntax

LOAD IPXPING

Using IPXPING

◆ IPXPING sends an IPX ping request packet to an IPX target node (server or workstation). When the target node receives the request packet, it sends back a reply packet.

◆ To select an IPX server or workstation, enter its IPX internal network number and node number.

You can also specify the number of seconds between each request packet transmission.

◆ To start sending request packets, press **<Esc>**. The sending node continues to send request packets and collect response time statistics until you press **<Esc>** again to exit IPXPING.

◆ Request and reply packets use the same format; each packet contains the standard IPX header.

◆ To add other nodes, press **<Insert>** and select another server.

Additional Information

Topic	See
IPX protocol	<i>NetWare IPX Reference.</i>
IPX network and node addressing	<i>NetWare IPX Reference.</i>

IPXS

Purpose

Provides IPX protocol to NLM programs that require STREAMS™ - based IPX.

Syntax

LOAD [path]IPXS [LDFILE = [path]filename[ext]]

Parameter	Use to
<i>path</i>	Specify the path to IPXS.NLM if you moved it from the default directory.
LDFILE = <i>filename</i>	(Optional) Specify a filename that contains the SAP filtering, SAP and RIP timers, and IPX configuration parameters.
	Note: If you don't specify a filename, IPXS sets the parameters defined in the IPXSPX.CFG file.
	If you don't specify a file extension, the default is .CFG.
	For example, to load an alternate configuration file, type
	LOAD IPXS LDFILE = IPXSPX2.CFG

Using IPXS



The IPXSPX.CFG file is modified from the INETCFG utility when you set SPX/IPX parameters.

- ◆ When you load IPXS, STREAMS is autoloaded.

- ◆ IPXSPX.CFG contains the Service Advertising Protocol (SAP) filtering, SAP and Router Information Protocol (RIP) timers, and the IPX configuration defaults.
- ◆ You can create multiple configuration files in addition to IPXSPX.CFG. Use this feature if you frequently alternate between two or more IPX/SPX configurations.

To create multiple configuration files, copy the IPXSPX.CFG file to a new filename (IPXSPX2.CFG, for example). Then you can change the IPXSPX.CFG file (by using INETCFG) and still preserve the original configuration in the IPXSPX2.CFG file.

- ◆ To load a configuration file other than the default IPXSPX.CFG file, use the LDFILE option.

For example, if you have a second configuration file called IPXSPX2.CFG, you can load that configuration by typing

```
LOAD IPXS LDFILE = IPXSPX2
```

Additional Information

Topic	See
Filtering RIP and SAP packets using SET	"SET" (page 299).
Filtering RIP and SAP packets using FILTCFG	"FILTCFG" (page 76).
Setting IPX parameters using SET	"SET" (page 299).
Setting IPX parameters using INETCFG	"INETCFG" (page 95).
STREAMS-based protocols	"STREAMS" in <i>Concepts</i> .

KEYB

Purpose

Use at the server console to change the console keyboard type to the language of your keyboard.

The language you specify with KEYB must match the language of your keyboard, not the server language.



Changing the keyboard type causes some keys to represent different characters. Therefore, do not use this command unless you have the appropriate keyboard for the language you are specifying and you are familiar with the keyboard's use.

Syntax

LOAD [path]KEYB [keyboard_type]

Parameter	Use to
(no parameter)	View a list of available keyboard types.
<i>path</i>	Specify the path to KEYB.NLM if you moved it from the default directory.

Parameter	Use to
<i>keyboard_type</i>	Specify one of the following keyboard types: Belgium Canadian French Denmark France Germany Italy Latin America Netherlands Norway Portugal Russia Spain Sweden Swiss French Swiss German United Kingdom United States

Using KEYB

To change the keyboard type, unload KEYB and then reload it, specifying the new keyboard type parameter.

Additional Information

Topic	See
Changing the server keyboard type	"Changing the Server Keyboard Type" in Chapter 7 of <i>Supervising the Network</i> .

LANGUAGE

Purpose

Use at the server console to set the language for subsequently loaded modules.



LANGUAGE does not change the language of the operating system or of currently loaded modules.

The LANGUAGE command gives the modules access to directories containing message files in the specified language. This directory structure is under SYS:SYSTEM as follows:

SYS:SYSTEM\NLS\Language_number

Syntax

LANGUAGE [*language_name* | *number*] [**LIST** | **REN** *number* *new_name*]

Parameter	Use to
(no parameter)	View the current language setting for modules.
<i>language_name</i> <i>number</i>	Specify a language by its name or number. The following languages are available with the initial release of NetWare 4.1: <ul style="list-style-type: none"> 4=ENGLISH 6=FRENCH - FRANCE 7=GERMAN 8=ITALIAN 14=SPANISH - LATIN AMERICA
LIST	Display a list of language names and numbers. (Not all languages in the list are supported.)

LANGUAGE

Parameter	Use to
REN <i>number new_name</i>	Rename a language specified by a language number. The syntax is: LANGUAGE REN <i>number new_name</i>

Examples

- ◆ To set a module to use the German message files, type

LANGUAGE GERMAN

or

LANGUAGE 7

- ◆ To change the name of Spanish to Espanol, type

LANGUAGE REN 14 Espanol

- ◆ To display a list of language names and numbers, type

LANGUAGE LIST

Additional Information

Topic	See
Specifying a language for modules	“Specifying a Language for an NLM” in Chapter 7 of <i>Supervising the Network</i> .

LIST DEVICES

Purpose

Use at the server console to display a list of the devices on the server and to register new devices with the server.

A device can be a disk driver, tape driver, magneto-optical disc driver, CD-ROM, or any other physical storage medium.

Syntax

LIST DEVICES

Using LIST DEVICES

The command output is returned by the device drivers. The information for each device includes the device number and name, as well as additional information that varies by device and by manufacturer.

Following is an example of a device listing:

1. Device #0 Conner Peripherals 121MB - CF3
2. Device #1 Compaq IDA Slot 1 Dsk 1 NFT

LOAD

Purpose

Use at the server console to link loadable modules to the operating system. Loadable modules include disk drivers, LAN drivers, NLM programs, and name space modules.

Syntax

LOAD [path]loadable_module_name [parameter...]

Parameter	Use to
<i>path</i>	Specify the path to the loadable module if you moved it from the default directory.
<i>loadable_module_name</i>	Specify the name of the loadable module. To determine the name, see the documentation for the loadable module.
<i>parameters</i>	Include parameters specific to the module you are loading. See the documentation for the loadable module.

Using LOAD

- ◆ When a module is loaded, it links itself to the system and allocates a portion of the server's memory for its use, thus using system resources. When modules are unloaded, allocated resources are returned to the system.

Some modules, such as LAN drivers and disk drivers, need to be loaded every time the server is booted. To load modules automatically when the server boots, include LOAD commands in the AUTOEXEC.NCF or STARTUP.NCF file. (See "Creating or Editing a Server Batch (.NCF) File" in Chapter 7 of *Supervising the Network*.)

Other modules, such as INSTALL, can be loaded, used, and then unloaded. Refer to the documentation for the specific module.

- ◆ LAN drivers can also be loaded with INSTALL and with INETCFG. (See "Loading and Binding LAN drivers" in Chapter 7 of *Supervising the Network* and "INETCFG" on page 95.)
- ◆ When you install SYSTEM and PUBLIC files, any .NLM and .LAN modules are copied to SYS:SYSTEM. The .DSK and .NAM modules are copied to the boot directory of the server.
- ◆ If you receive an error message indicating that a third-party NLM is not allowing low-priority processes to run, load the NLM using this option: (CLIB_OPT)/Y. This option instructs the system to run low-priority processes as well as high-priority ones. The command syntax is:

LOAD *third-party NLM* (CLIB_OPT)/Y

The parentheses are required.

- ◆ If you are unsure of the source or purpose of a third-party module, test the module in a secure environment by using a load parameter provided by DOMAIN. (For more information, see "DOMAIN" on page 55.)

LOAD

Examples

- ◆ To load a DCB driver, type

LOAD A:DCB PORT=320

- ◆ To load an ISADISK driver, type

LOAD A:ISADISK

- ◆ To load the NE3200™ driver (without parameters), type

LOAD NE3200

- ◆ To load the TRXNET driver (with parameters), type

LOAD TRXNET INT=3 PORT=2E0 MEM=C0000

- ◆ To load the Macintosh name space module, type

LOAD MAC

- ◆ To load the INSTALL module, type

LOAD INSTALL

Additional Information

Topic	See
Loading disk drivers	"Load the Disk Drivers and CD-ROM Drivers" in Chapter 3 of <i>Installation</i> .
Loading LAN drivers	"Loading and Binding LAN Drivers" in Chapter 7 of <i>Supervising the Network</i> .
Loading name space modules	"Setting Up a Volume to Store Non-DOS Files" in Chapter 7 of <i>Supervising the Network</i> .
Loading modules	"Loading a NetWare Loadable Module" in Chapter 7 of <i>Supervising the Network</i> .
Protecting the operating system's memory	"Protecting the Operating System's Memory" in Chapter 7 of <i>Supervising the Network</i> .

LOGIN**Purpose**

Use at a workstation to access the network by logging in to a server and running a login script.

Syntax

```
LOGIN [server name/ | tree/] [user] [/option...]  
[/? | /VER]
```

Parameter	Use to
(no parameter)	Request a login prompt.
<i>server name/</i>	Specify the server you want to log in to.
<i>tree/</i>	Specify the tree you want to log in to.
<i>user</i>	Specify the username you want to log in with.
<i>/option</i>	Replace <i>option</i> with any available option. See “ LOGIN Options ” on page 120.
<i>/?</i>	View online help. All other parameters are ignored when <i>/?</i> is used.
/VER	View the version number of the utility and the list of files it uses to execute. All other parameters are ignored when /VER is used.

Using LOGIN

- ◆ Using LOGIN implies use of the LOGOUT command. That is, using LOGIN to access an additional server logs you out of all other servers.

To remain logged in to other servers, use the “no script” (/NS) option.

Note 

Using the /NS option is similar to using the ATTACH command in NetWare 3.

- ◆ To use another object’s login script, you need the Read property right to the Login Script property of that object. This login script replaces the profile script (if one is specified).
- ◆ To set your context before you log in, either use the CX command or set your context in the NET.CFG file using the following statement:

name context = “complete name”

Note 

For OS/2 do not use the equals sign or quotation marks.

LOGIN Options

Option	Use to
/NS	Prevent a login script from running and prevent you from being logged out of other servers you are logged in to.
/NB	Prevent the "Welcome to NetWare" banner from being displayed during the login process.
/S <i>path</i> <i>object name</i>	Specify a login script file. Replace <i>path</i> with the path to the script. Replace <i>object name</i> with the object whose script you want to run.
/B	Specify a bindery login.
/PR= <i>profile object name</i>	Specify the Profile object script you want to run.
/NOSWAP	Prevent LOGIN from swapping to extended or expanded memory, or to disk.
SWAP= <i>path</i>	Tells login to swap to this path when external commands are executed. DOS only.
/TREE	Specify that you want to log in to a tree.

Examples

- ◆ To log in to server MOUSE as user RICKY without logging out of other servers you are logged in to, type

LOGIN MOUSE/RICKY /NS

- ◆ To log in to tree TERMINAL as user RICK, type

LOGIN TERMINAL/RICK /TREE

- ◆ To log in to the Directory tree as user SAM (if current context is set to SAM's container), type

LOGIN SAM

- ◆ To log in as user SAM and specify a Profile object to use as a login script, type

LOGIN SAM /PR=WPGROUP.NOVELL

Additional Information

Topic	See
Login scripts	"Login scripts" in <i>Concepts</i> "About Login Scripts" in Chapter 3 of <i>Supervising the Network</i> .
Using NOSWAP with LOGIN.EXE	"NOSWAP" in Chapter 3 of <i>Supervising the Network</i> .

LOGOUT

Purpose

Use at a workstation to exit the network or to log out of servers.

Syntax

LOGOUT [*server name* | /T] [/? | /VER]

Parameter	Use to
(no parameter)	Exit the network by logging out of all servers and Directory Services.
<i>server name</i>	Specify the server you want to log out of if you want to log out of one server but remain logged in to other servers or to the Directory tree.
/option	Replace <i>option</i> with any available option.
/T	Log out of Directory Services and all servers in the Directory tree, but not out of bindery servers (NetWare 2 and 3 servers).
/?	View online help. All other parameters are ignored when /? is used.
/VER	View the version number of the utility and the list of files it uses to execute. All other parameters are ignored when /VER is used.

Using LOGOUT

You can use wildcard characters in the *server name* parameter.

Examples

- ◆ To log out of all servers, type

LOGOUT

- ◆ To log out of server EXODUS while remaining logged in to other servers, type

LOGOUT EXODUS

- ◆ To log out of all servers that begin with TEST, type

LOGOUT TEST*

MAGAZINE

Purpose

Use at the server console in response to the screen prompts “Insert Magazine” and “Remove Magazine.” The screen prompts refer to media magazines (hardware devices that hold several pieces of media).

Syntax

MAGAZINE [parameter]

Parameter	Use to
Inserted	Confirm that the media magazine was inserted in response to the “Insert Magazine” prompt.
Not Inserted	Confirm that the media magazine was not inserted in response to the “Insert Magazine” prompt.
Not Removed	Confirm that the media magazine was not removed in response to the “Remove Magazine” prompt.
Removed	Confirm that the media magazine was removed in response to the “Remove Magazine” prompt.

MAP

Purpose

Use at a workstation to

- ◆ View drive mappings
- ◆ Create or change network or search drive mappings
- ◆ Map a drive to a fake root directory (for applications that must use a root directory)

Syntax

```
MAP [P | NP] [option...] drive:= [drive: | path]
      [/? | /VER]
```

Parameter	Use to
(no parameter)	View drive mappings.
P	Map to a physical volume. Must be listed first or second.
NP	Overwrite local or search drives without being prompted. Must be listed first or second.
<i>option</i>	Replace <i>option</i> with any available option. See “MAP Options” on page 127.
<i>drive:</i>	Specify the drive you want to change.
<i>path</i>	Specify the path you want to map a drive to. To map to a physical volume on a server that is not your default server, specify the entire path (including server, volume, and directory name). For example, MACBETH/SYS:ACCOUNTS PAY (server/volume:directory\subdirectory)

Parameter	Use to
/?	View online help. All other parameters are ignored when /? is used.
/VER	View the version number of the utility and the files it uses to execute. All other parameters are ignored when /VER is used.

Using MAP

- ◆ If you don't include drive mappings in your login script, they will have to be manually recreated each time the user logs in. (See "Creating Login Scripts" in Chapter 3 of *Supervising the Network*.)
- ◆ You can have up to 26 mappings, including local drives.
- ◆ Search drive mappings begin with the letter Z and continue backward through the alphabet.
- ◆ To map a search drive, use S and a number. (See "MAP Options" on page 127.)
- ◆ If you don't want to overwrite existing search drives, use the "INS" option.
- ◆ To map to the next available search drive, use "S16:="

MAP Options

Option	Use to
P	Map to a physical volume. Must be listed first or second.
Np	Overwrite local or search drives without being prompted. Must be listed first or second.
C	Change a regular drive to a search drive, or a search drive to a regular drive.
DEL	Delete a drive mapping.
INS	Insert a search drive mapping without replacing an existing mapping.
N	Map the next available drive to the specified path.
ROOT	Map a drive to a fake root directory for applications that require rights in a root directory.
W	Do not change master environment.

Examples

- ◆ To view mappings, type

MAP

- ◆ To map drive G: to SYS:\HOME\JAN on the current server, type

MAP G:=SYS:\HOME\JAN

- ◆ To extend the mapping for drive G: above to SYS:\HOME\JAN\PROJECTS, type

MAP G:=PROJECTS

- ◆ To map search drive 4 to PRUFROCK (server) SYS (volume) APP (directory), type

MAP S4:=PRUFROCK/SYS:APP

- ◆ To change Y: from a regular NetWare drive to a search drive, type

MAP C Y:

- ◆ To delete the mapping for drive G:, type

MAP DEL G:

- ◆ To map drive F: to the DOSGAMES volume of the GAMES directory as a fake root, type

MAP ROOT F:=GAMES\DOSGAMES:

- ◆ To map the last possible search drive to IZARD (server) SYS (volume) PUBLIC (directory), type

MAP S16:=IZARD/SYS:PUBLIC

- ◆ To map the next available drive to Z:\PUBLIC\DO\$\\APP from Z:\PUBLIC, type

MAP N DO\$\\APP

- ◆ To map the next available drive to BRUTUS/SYS:ACCT\\OLD, type

MAP N BRUTUS/SYS:ACCT\\OLD

- ◆ To insert COUNT (server) SYS (volume) PUBLIC (directory) as a new search drive, type

MAP INS S4:=COUNT/SYS:PUBLIC

- ◆ To map to PUBLIC\RPTS under Volume object SYS.ACOUNTING.ACME.US from the root, type

MAP H:=.SYS.ACOUNTING.ACME.US:PUBLIC\RPTS

Additional Information

Topic	See
Directory Map objects	“Directory Map object” in <i>Concepts</i> .
Fake roots	“Fake root” in <i>Concepts</i> .
Login scripts	“Login scripts” in <i>Concepts</i> .
Search drive mappings	“About Login Scripts” in Chapter 3 of <i>Supervising the Network</i> . “Drive mapping” and “Search drive” in <i>Concepts</i> .

MATHLIB

Purpose

Used at the server to provide mathematical functions to CLIB.

For maximum performance, use at the server console if your server has a math coprocessor, since MATHLIB invokes floating point instructions. If your server does not have a math coprocessor, see "MATHLIBC" on page 132.



If MATHLIB is loaded and your server does not support floating point instructions, MATHLIB will still work by emulating floating point instructions.

Syntax

LOAD [path]MATHLIB

Parameter	Use to
<i>path</i>	Specify the path to MATHLIB if you moved it from the default directory.

Using MATHLIB

- ◆ You must load STREAMS and CLIB before you load MATHLIB.

Load the modules in the following order:

STREAMS
CLIB
MATHLIB

- ◆ To load MATHLIB modules automatically when the server boots, add the following to the AUTOEXEC.NCF file:

LOAD STREAMS
LOAD CLIB
LOAD MATHLIB

Additional Information

Topic	See
Editing the AUTOEXEC.NCF file	"Modify the AUTOEXEC.NCF File" in Chapter 3 of <i>Installation</i> . "Creating or Editing a Server Batch (.NCF) File" in Chapter 7 of <i>Supervising the Network</i> .

MATHLIBC

Purpose

Used at the server to provide mathematical functions to CLIB.

For maximum efficiency, use MATHLIBC if your server *does not* have a math coprocessor, since MATHLIBC automatically uses a floating point emulator. If your server does have a math coprocessor, see “MATHLIB” on page 130.

Syntax

LOAD [path]MATHLIBC

Parameter	Use to
<i>path</i>	Specify the path to MATHLIBC if you moved it from the default directory.

Using MATHLIBC

- ◆ You must load STREAMS and CLIB before you load MATHLIBC. Load the modules in the following order:

STREAMS
CLIB
MATHLIBC

- ◆ To load MATHLIBC modules automatically each time the server boots, add the following to the AUTOEXEC.NCF file:

LOAD STREAMS
LOAD CLIB
LOAD MATHLIBC

Additional Information

Topic	See
Editing the AUTOEXEC.NCF file	<p>“Modify the AUTOEXEC.NCF File” in Chapter 3 of <i>Installation</i>.</p> <p>“Creating or Editing a Server Batch (.NCF) File” in Chapter 7 of <i>Supervising the Network</i>.</p>

MEDIA**Purpose**

Use at the server console in response to the screen prompts “Insert Media” and “Remove Media.”

Syntax

MEDIA [*parameter*]

Parameter	Use to
Inserted	Confirm that the specified media was inserted in response to the “Insert Media” prompt.
Not Inserted	Confirm that the specified media was not inserted in response to the “Insert Media” prompt.
Not Removed	Confirm that the specified media was not removed in response to the “Remove Media” prompt.
Removed	Confirm that the specified media was removed in response to the “Remove Media” prompt.

MEMORY

Purpose

Use at the server console to display the total amount of installed memory that the operating system can address.

Syntax

MEMORY

About Memory Addressing

- ◆ On EISA bus computers, NetWare 3.1 and later versions address memory above 16 MB.
- ◆ On microchannel and ISA (AT) bus computers, NetWare (all versions) can address memory only up to 16 MB.
- ◆ On PCI bus computers, NetWare 4.1 can address up to 64 MB.

Additional Information

Topic	See
Enabling the operating system to address memory above 16 MB	"REGISTER MEMORY" (page 239).

MEMORY MAP

Purpose

Use at the server console to display the amount of memory (in bytes) allocated to DOS and to the server.

Syntax

MEMORY MAP

Using MEMORY MAP

In NetWare 4.1 SFT III, MEMORY MAP displays the memory allocated to DOS, the IOEngine, and the MEngine (the unclaimed memory if the MEngine is not loaded). SFT III allocates the unclaimed memory to the MEngine during synchronization.

- ◆ MEMORY MAP can help you determine if your SFT III servers are addressing equal amounts of memory. If the two servers have unequal amounts of RAM installed, you may experience synchronization problems.
- ◆ In SFT III, you must execute MEMORY MAP from the IOEngine. If you execute MEMORY MAP while in the MEngine, the system recognizes MEMORY MAP as the MEMORY command.

In native NetWare, MEMORY MAP displays the memory allocated to DOS and to the server's memory.

MIRROR STATUS

Purpose

Use at the server console to

- ◆ View the status of mirrored disk partitions
- ◆ View the percentage of mirrored data on each partition

Syntax

MIRROR STATUS [*logical_partition_number*]

Parameter	Use to
(no parameter)	View a list of all logical disk partitions.
<i>logical_partition_number</i>	Display the partition's physical device number(s), as well as its mirrored status.

Using MIRROR STATUS

If you specify a logical partition number, MIRROR STATUS displays the partition's physical device number as well as its mirrored status. The possible status messages are explained in the following table.

Status	Explanation
Being remirrored	Remmirroring is in progress, and the percent completed is displayed.
Fully synchronized	The mirrored partitions have the same data. Remmirroring is complete.
	For SFT III systems, this message refers to unmirrored drives synchronized with themselves.

MIRROR STATUS

Status	Explanation
Not mirrored	Disk mirroring was not set up for this partition. It has no mirrored partner.
Orphaned state	An error occurred during remirroring with the result that the partition was not remirrored.
Out of synchronization	Note: You can restore the orphaned partition to its mirrored partner with INSTALL.
	One partition does not have the same data as its partner, and it is not being remirrored.

In SFT III systems, MIRROR STATUS must be executed from the MSEngine. If you execute MIRROR STATUS from either IOEngine, you receive an "Unknown command" error message.

Additional Information

Topic	See
Mirroring disks	"Mirroring and Duplexing a Hard Disk" in Chapter 7 of <i>Supervising the Network</i> .

MODULES

Purpose

Use at the server console to display a list of currently loaded modules. For each module, the command displays the following information:

- ◆ The module short name
- ◆ A descriptive string or long name for each module
- ◆ The version number if the module is a disk driver, LAN driver, or NLM

Syntax

MODULES

Using Modules

The following example illustrates the output of the MODULES command:

```
ETHERTSM.NLM
  Novell Ethernet Topology Specific Module
  Version 2.30 December 30, 1994
  Copyright 1994 Novell, Inc. All rights reserved

NE2000.LAN
  Novell NE2000
  Version 3.20 December 30, 1994
  Copyright 1994 Novell, Inc. All rights reserved.

DS.NLM
  NetWare Directory Services (419)
  Version 4.10 December 30, 1994
  Copyright 1993-94 Novell, Inc. All rights reserved.
```

Additional Information

Topic	See
Loadable modules	"NetWare Loadable Module" in <i>Concepts</i> .
Loading modules	"Loading a NetWare Loadable Module" in Chapter 7 of <i>Supervising the Network</i> .
	"LOAD" (page 114).

MONITOR

Purpose

Use at the server console to

- ◆ View server activity
- ◆ Lock the console
- ◆ Assess server RAM and CPU utilization
- ◆ Optimize memory by performing garbage collection

Syntax

LOAD [path]MONITOR [option]

Parameter	Use to
<i>path</i>	Specify the path leading to MONITOR if you moved it from the default directory.
<i>option</i>	Specify a MONITOR option. See “MONITOR Options” on page 142.

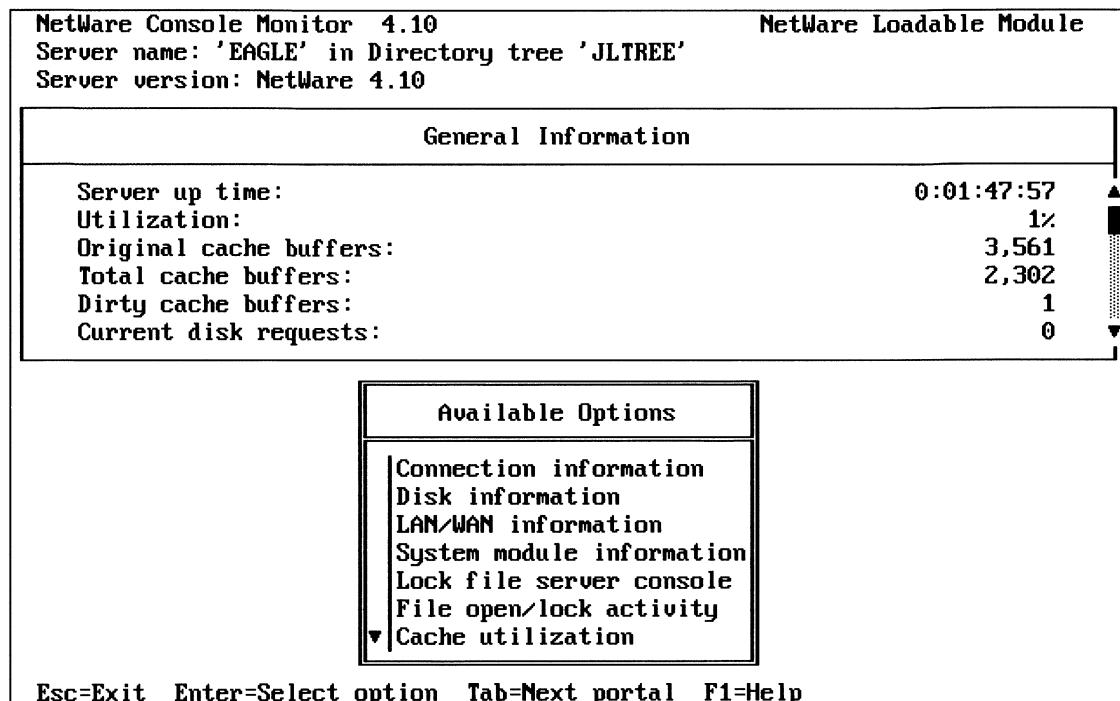
MONITOR Options

Option	Use to
L	<p>Lock the console upon loading MONITOR.</p> <p>To lock the console upon booting, place this option in the AUTOEXEC.NCF file.</p> <p>Note: If you use this option, use the supervisor password to unlock the console.</p>
N	<p>Load MONITOR without the screen saver.</p> <p>By default, NetWare has a snake-like screen saver that moves randomly on the server screen.</p> <p>If you load MONITOR without the N option, a snake appears on the screen after 1 minute of inactivity if the console is locked (after 10 minutes if it is not locked).</p> <p>As network use increases, the snake moves faster and the tail gets longer. To retrieve the MONITOR display, press any key.</p>

Using MONITOR

The main MONITOR screen displays server statistics and a menu that allows you to access additional information. The following figure shows a typical main screen display.

Figure 2-6
The MONITOR Main
Screen



See the following tables for explanations of the information on the MONITOR screen:

- ◆ Table 2-1, "Statistics in the MONITOR "General Information" Display" on page 144.
- ◆ Table 2-2, "MONITOR "Available Options" Menu" on page 146.

Note 

For information about all MONITOR statistics and menu options, press <F1> for online help.

Table 2-1
Statistics in the MONITOR “General Information” Display

Statistic	Explanation
Operating system version and date	The version and release date of the system (upper left corner of the screen).
Server <i>server name</i> on network <i>tree name</i>	The name of the server and the NetWare Directory Services tree name.
Server Up Time	The length of time the server has been running since it was last booted.
Utilization	Reflects CPU utilization. This number is relative to the amount of time the kernel spends in the idle loop process. This value is reset when a change in system configuration occurs such as an NLM being loaded or unloaded, or a volume being mounted or dismounted.
	Note: To measure CPU utilization exactly, see the histogram displayed when you select either “Scheduling Information” or “Processor Utilization” from the “Available Options” menu.
Original Cache Buffers	The number of cache buffers available when the server is booted. The figure represents the number of blocks installed as cache memory in your server. Default block size: 4 KB.
Total Cache Buffers	The number of blocks available for file caching. This number decreases as modules are loaded.
Dirty Cache Buffers	The number of file blocks in memory waiting to be written to disk.
Current Disk Requests	The number of disk requests (in a queue) the server is waiting to service.
Packet Receive Buffers	The number of buffers available to handle station requests. Default: 10.
Directory Cache Buffers	The number of buffers allocated to handle directory caching.

Table 2-1 *continued***Statistics in the MONITOR “General Information” Display**

Statistic	Explanation
Maximum Service Processes	<p>Indicates the number of task handlers the system allocates to service client requests.</p> <p>The default number of service processes is 20. The possible range is 5 to 100.</p> <p>Once memory is allocated for service processes, it remains allocated even when no longer required. Each service process requires 4 KB of RAM.</p> <p>You can set this parameter using SET. For more information, press <F1> for online help.</p>
Current Service Processes	<p>The number of service processes currently allocated. If this number corresponds to the “Maximum Service Processes” value, you should allocate more service processes. Use the SET utility to set the Maximum Service Processes parameter.</p> <p>If the Current Service Processes value corresponds to the maximum possible (100), performance will be adversely affected.</p>
Maximum Licensed Connections	The maximum number of licensed server connections possible. This number corresponds with the number-of-users version of NetWare you purchased.
Current Licensed Connections	<p>The number of active licensed connections. These connections count toward the limit on your NetWare license.</p> <p>For example, if you have a NetWare license for 50 users and there are currently 45 licensed connections, you have 5 unused connections.</p> <p>To view the current licensed connections, choose the “Connection Information” option from the “Available Options” menu.</p>
Open Files	The number of files being accessed by the server and by workstations.

Table 2-2
MONITOR “Available Options” Menu

Menu Option	Use to
Connection Information	<ul style="list-style-type: none"> List active connections. List licensed and unlicensed connections. List record locks for a user. Clear a connection. List open files. List record lock status of open files.
Disk Information	<ul style="list-style-type: none"> List system hard disks. List volume segments per hard disk. Change the “Read After Write Verify” status of the hard disk. Flash the hard disk light. Change the drive light status. Activate/deactivate a hard disk. Mount/dismount a removable media device. Lock/unlock a removable media device.
LAN/WAN Information	<ul style="list-style-type: none"> List LAN driver configuration and statistics. View the LAN driver version and the protocols bound to it. View node and network address. <p>Note: For information on each LAN driver statistic, see “LAN Driver Statistics” on page 467.</p> <p>Note: MONITOR does not provide LAN driver statistics for SFT III servers.</p>
System Module Information	<ul style="list-style-type: none"> List modules loaded on the system by name, size, and version. List size of module code and data image. List resources allocated by the module (resource tags). View resource tag memory usage.
Lock File Server Console	<ul style="list-style-type: none"> Lock or unlock the server console keyboard. <p>Once the keyboard is locked, you cannot change screens until you unlock the keyboard, using either the password that you used to lock the console or the ADMIN password.</p>

Table 2-2 *continued***MONITOR “Available Options” Menu**

Menu Option	Use to
File Open/Lock Activity	<p>Check a file's lock activity and status.</p> <p>View which stations have open files.</p> <p>View mounted volumes and directories on each volume.</p> <p>View files in a directory.</p>
Cache Utilization	<p>View disk cache block request statistics including: total cache block requests, the number of times a block request had to wait because there were no available cache blocks, long and short term cache hits and dirty cache hits.</p> <p>Use the Long Term Cache Hits information (the percentage of time the operating system retrieves the data it needs directly from cache) to assess server RAM.</p> <p>Note: For more information on these statistics, press <F1> for help while in this screen.</p>
Processor Utilization	<p>Select an active process or multiple processes and available interrupts to sample for a histogram.</p> <p>View a histogram for the selected processes.</p> <p>The histogram displays CPU usage and the number of times the CPU has serviced the process during the sample period.</p> <p>To measure CPU utilization, view the Idle Loop process in this screen and find the LOAD percentage associated with this process.</p> <p>To calculate exact CPU utilization, subtract this percentage from 100%.</p>
Resource Utilization	<p>View memory usage statistics for the cache buffer pool, allocated memory in movable and non-movable memory pools, and code and data memory.</p> <p>View tracked resources (resource tags) allocated by the operating system and NLM programs.</p> <p>When you select “Resource Utilization,” the upper screen displays a “Server Memory Statistics” window.</p>

MONITOR

Table 2-2 *continued*

MONITOR “Available Options” Menu

Menu Option	Use to
Memory Utilization	<p>View allocated memory information for the entire system or for one selected system module.</p> <p>View memory statistics such as the percent of allocated memory in use, memory blocks and bytes in use, free blocks.</p> <p>Perform garbage collection from a module's “Allocated Memory Information” screen.</p> <p>Note: For more information, press <F1> for help while in this screen.</p>
Scheduling Information	<p>View and change the priority of a process by delaying CPU execution of a process.</p> <p>View the number of times the process ran during the sample period and the CPU time spent executing code for that process.</p>
Exit	Exit MONITOR.

Additional Information

Topic	See
Assessing server RAM utilization	“Assessing Server RAM” in Chapter 7 of <i>Supervising the Network</i> .
Checking a server’s processor utilization	“Checking a Server’s Processor Utilization” in Chapter 7 of <i>Supervising the Network</i> .
Checking for disk errors	“Checking For Disk Errors” in Chapter 7 of <i>Supervising the Network</i> .
Listing LAN drivers and statistics	“Viewing LAN Driver Statistics” in Chapter 7 of <i>Supervising the Network</i> .
LAN driver statistics	Appendix B, “LAN Driver Statistics” (page 467).
Clearing workstation connections	“Clearing A Workstation Connection” in Chapter 7 of <i>Supervising the Network</i> .
	“CLEAR STATION” (page 35).
Increasing communications buffers	“Increasing the Maximum Number of Packet Receive Buffers” in Chapter 7 of <i>Supervising the Network</i> .
Prioritizing server processes	“SCHDELAY” (page 280).
	“Prioritizing Server Processes” in Chapter 7 of <i>Supervising the Network</i> .

MOUNT

Purpose

Use at the server console to make a volume available to users.



CD-ROM volumes must be mounted using the CD command. For more information, see “CD” on page 24.

Syntax

MOUNT *volume_name* | **ALL**

Parameter	Use to
<i>volume_name</i>	Specify the name of the volume you want to mount.
ALL	Mount all volumes not mounted.

Using MOUNT

- ◆ If you set up the AUTOEXEC.NCF file to mount all volumes automatically each time the server comes up, then you would use the MOUNT command only if you have dismounted a volume and want to remount it.
- ◆ After you replace a removable drive, use this command to mount all volumes residing on the removable drive.
- ◆ You can mount and dismount volumes while the server is running.
- ◆ You can also use INSTALL to mount a volume. Select “Volume Options” from the “Installation Options” menu.

Examples

- ◆ To mount volume STATISTICS, type

MOUNT STATISTICS

- ◆ To mount all unmounted volumes at once, type

MOUNT ALL

MSERVER

Purpose

Use at the server console to load the IOEngine on each NetWare 4.1 SFT III server.

Syntax

MSERVER [parameter...]

Parameter	Use to
-ns	Prevent execution of the IOSTART.NCF file. This parameter is useful if you are changing commands in your IOSTART.NCF file.
-na	Prevent execution of the IOAUTO.NCF file. This parameter is useful if you are changing the modules loaded by your IOAUTO.NCF file.
Both (-ns -na)	Load the IOEngine without executing the IOSTART.NCF and IOAUTO.NCF files.

Using MSERVER

- ◆ MSERVER executes the IOSTART.NCF and IOAUTO.NCF files.
- ◆ Execute MSERVER from the DOS prompt of each SFT III server.
- ◆ Type MSERVER parameters in lowercase.
- ◆ If the IOSTART.NCF file doesn't exist, MSERVER prompts you for an IOEngine name and an IPX internal network number.

NAME

Purpose

Use at the server console to display the server name.

Syntax

NAME

NCOPY

Purpose

Use at a workstation to copy files or directories from one location to another.

Syntax

```
NCOPY [source_path] filename target_path [filename]  
      [/option...] [/? | /VER]
```

Parameter	Use to
<i>source_path</i>	Specify the path leading to the source file. (You can use a drive letter.) Include this if the file is not in your current directory.
<i>filename</i>	Specify the file you want to copy.
<i>target_path</i>	Specify the path for the directory you are copying the file to. (You can use a drive letter.)
[<i>filename</i>]	Specify a new name for the file (if you want to rename the file.)
<i>/option</i>	Replace <i>option</i> with any available option. See “NCOPY Options” on page 155.
/?	View online help. All other parameters are ignored when /? is used.
/VER	View the version number of the utility and the files it uses to execute. All other parameters are ignored when /VER is used.

Using NCOPY

- ◆ You can use drive letters instead of directory paths to specify source and target paths.
- ◆ You can use wildcard characters.

NCOPY Options

Option (Option Name)	Use to
A (Archive Bit Only)	Copy only those files that have the archive bit set. The attribute of the source file is not changed.
M (Archive Bit Set)	Copy files that have the archive bit set. Turns off the archive bit of the source file. This option allows NCOPY to be used in backup.
C (Copy)	Copy files without preserving extended attributes and name space information.
F (Force Sparse Files)	Force the operating system to copy sparse files.
I (Inform)	Notify you when extended attributes or name space information cannot be copied because the target volume doesn't support those features.
R (Retain Compression)	Keep compressed files compressed.
/R/U (Retain Unsupported Compression)	Keep compressed files compressed even when they are copied to media that doesn't support compression.

NCOPY

Option (Option Name)	Use to
S (Subdirectories)	Copy subdirectories as well as files.
/S /E (Subdirectories Empty)	Copy empty subdirectories as well as files.
V (Verify)	Verify that the original and the new files are identical. For local DOS drives only.

Examples

- ◆ To copy an empty subdirectory to the subdirectory above your current drive, type

NCOPY WORK .. /S /E

- ◆ To copy files that start with S and have a .TXT extension and have the archive bit set to a subdirectory named TEST below your current directory, type

NCOPY S*.TXT TEST /A

- ◆ To copy all files from C:\DOS to D:\TEMP when you are not in either directory, type

NCOPY C:\DOS *.* D:\TEMP

- ◆ To copy all files with the .RPT extension to SERVER1_SYS:PUBLIC\SHARE on another volume and be notified if extended attributes or name space information cannot be copied, type

NCOPY *.RPT SERVER1_SYS:PUBLIC\SHARE /I

- ◆ To copy all files with the .DOC extension to directory ACCT and verify that the original and the new files are identical, type

NCOPY *.DOC ACCT /V

- ◆ To copy a file named MARCH.RPT to drive G:, type

NCOPY MARCH.RPT G:

- ◆ To copy all files and subdirectories in the current directory to a subdirectory, type

NCOPY *.* .. \TEMP /S

- ◆ To copy all files with the .RPT extension to PUBLIC\RPTS under Volume object ACCT_SYS.ACOUNTING.ACME.US from the root, type

**NCOPY *.RPT .ACCT_SYS.ACOUNTING
.ACME.US:PUBLIC\RPTS**

Additional Information

Topic	See
Sparse files	“Sparse file” in <i>Concepts</i> .
Name space	“Name space support” in <i>Concepts</i> .
Archive bit	“Attributes” in <i>Concepts</i> .

NCUPDATE

Purpose

Use at a workstation to automatically update users' NET.CFG files with a new name context after a container has been moved or renamed.

Syntax

NCUPDATE [/? | /VER] [/NP]

Parameter	Use to
/?	View online help. All other parameters are ignored when /? is used.
/VER	View the version number of the utility and the files it uses to execute. All other parameters are ignored when /VER is used.
/NP	Avoid getting the prompt that asks whether to update the name context in the NET.CFG file."

Using NCUPDATE

- ◆ You can execute NCUPDATE at the command line, but it is designed to be run from a container login script.
- ◆ When you move or rename a container object using NetWare Administrator or NETADMIN, you can create an alias that points to the moved or renamed container.

An alias allows users who don't know the container has been moved or renamed to continue seeing the container (and the objects in it) by its original name or in its original location.

In addition, an alias allows users whose name context in their NET.CFG file refers to the moved or renamed container to continue to be able to log in, even though their actual context in the Directory tree has changed.

- ◆ Since moving or renaming a container object changes the context of both the container and any users below the container, users in and below that container must update their name context in their NET.CFG file.
- ◆ To automatically update user NET.CFG files, place a command to execute NCUPDATE in the login script of the moved or renamed container and every container in and below it.
- ◆ When users who are in or below the moved or renamed container log in, LOGIN will recognize that the context used to log in contains an alias. Then LOGIN will set the internal script variable LOGIN_ALIAS_CONTEXT to "Y."
- ◆ The network supervisor can place a command to run NCUPDATE in the login script of a container using NetWare Administrator or NETADMIN.

Examples

The network supervisor—or a user with the Supervisor object right to the moved or renamed container—can place the following lines in the login script of the container and every container in and below the container:

```
IF LOGIN_ALIAS_CONTEXT = "Y" THEN BEGIN
  MAP INS S1:=<server name>/SYS:PUBLIC
  #NCUPDATE /NP
  MAP DEL S1:
END
```

When users log in to the server using an alias context, NCUPDATE updates each user's name context in the NET.CFG file.



NCUPDATE updates the NET.CFG file that the Virtual Loadable Module™ (VLM) programs load from. The location of this NET.CFG file on users' workstations may vary, so the path to the NET.CFG file that will be updated is listed on the screen as NCUPDATE executes.

In the example login script, the supervisor maps a temporary search drive to SYS:PUBLIC so the container login script can locate NCUPDATE.EXE in the PUBLIC directory. Then the search drive is deleted.

The supervisor deletes the /NP in the example login script if he or she wants the users to be prompted to update their NET.CFG files.

Once all user NET.CFG files are updated, the supervisor deletes the alias that points to the moved or renamed container.

Additional Information

Topic	See
Alias objects	“Alias object” in <i>Concepts</i> .
Login scripts	“About Login Scripts” in Chapter 3 of <i>Supervising the Network</i> .
Moving container objects	“Moving Objects in the Directory Tree” in Chapter 1 of <i>Supervising the Network</i> .
Renaming container objects	“Renaming Leaf and Container Objects” in Chapter 1 of <i>Supervising the Network</i> .

NDIR

Purpose

Use at a workstation to

- ◆ View information about files (date, size, owner, attributes, archive information)
- ◆ View information about directories (creation date, owner, subdirectories, Inherited Rights Filter, effective rights)
- ◆ View volume information
- ◆ Sort information according to creation date, owner, file or directory attributes, etc.

Syntax

NDIR [*path*] [/option...] [/? | /VER]

Parameter	Use to
<i>path</i>	Specify the path leading to the information you want to view. Include the volume, directory, or filename.
/option	Replace <i>option</i> with any available option. See the following NDIR options: “NDIR Display Options” on page 162. “NDIR Format Options” on page 163. “NDIR Sort Options” on page 163. “NDIR Attribute Options” on page 164. “NDIR Restriction Options” on page 166.

Parameter	Use to
/?	View online help. All other parameters are ignored when /? is used.
/VER	View the version number of the utility and the files it uses to execute. All other parameters are ignored when /VER is used.

Using NDIR

- ◆ A forward slash (/) must precede the first option of the option list. Use backslashes (\) in pathnames.
- ◆ You can use several options, but separate the options by spaces.
- ◆ To view several files in your default directory, include a comma between filenames.
- ◆ You can use wildcard characters.

NDIR Display Options

Option	Use to
DO	Sort and view directories only.
FO	Sort and view files only.
FI	View every occurrence of the specified files within your current directory and your PATH environment.
SUB	Sort and view all subdirectories and their files.
VOL	View volume information for the specified volume.
SPA	View directory space limitation information for the specified directory.
C	Scroll continuously through a display.

NDIR Format Options

Option	Use to
DA	View dates when files were last updated, archived, accessed, created, and copied.
DE	View file details.
COMP	View file and compression sizes for NetWare 4 files.
LONG	View name space long filenames.
MAC	View Apple* Macintosh* files.
R	View file attributes, the compression and migration status, your effective rights, and the rights allowed to pass through the Inherited Rights Filter.

NDIR Sort Options

Option	Use to
REV	Reverse the direction of a sort. Put REV before SORT. Example: /REV SORT OW.
SORT CR	Sort by creation or copy date, from earliest to latest.
SORT UN	Suspend sorting.
SORT AC	Sort by date last accessed, from earliest to latest.
SORT AR	Sort by date last archived, from earliest to latest.
SORT UP	Sort by last update, from earliest to latest.
SORT OW	Sort alphabetically by file owner names.
SORT SI	Sort by file size, from smallest to largest.

NDIR Attribute Options

Option (option name)	Use to
NOT	View files that don't have a specified attribute. For example, to display all files in the current context that do not have the Di (Delete Inhibit) attribute, type:
	NDIR *.* /NOT /DI
A (Archive Needed)	View files modified since the last backup.
Ci (Copy Inhibit)	Prevent the file from being copied. This attribute applies to MAC files only.
Di (Delete Inhibit)	Prevent the file from being deleted.
Dc (Don't Compress)	Prevent the file from being compressed (regardless of what the volume or directory is set to).
Dm (Don't Migrate)	Prevent the file from being migrated to a secondary backup (regardless of what the volume or directory is set to).
Ds (Don't Suballocate)	Prevent an individual file from being suballocated, even if suballocation is enabled for the system.
X (Execute Only)	Prevent a file from being copied or copied over. This attribute can be given only to .EXE or .COM files, <i>and cannot be removed</i> .
H (Hidden)	Prevent a file from being seen with the DOS DIR command. The file can't be copied or deleted.
Ic (Immediate Compress)	Compress a file as soon as possible.

Option (option name)	Use to
P (Purge)	Purge a file immediately if the file is deleted.
R (Rename Inhibit)	Prevent a file from being renamed.
Ro (Read Only)	Allow a file to only be read—it can't be written to or deleted.
Rw (Read Write)	Allow a file to be read and written to.
S (Shareable)	Allow a file to be used by several users simultaneously.
Sy (System)	Prevent a file from being seen with the DOS DIR command. The file can't be copied or deleted.
T (Transactional)	Protect a file by using the Transaction Tracking System (TTS).

NDIR Status Flags



Status flags provide you with information only. You can't change them.

Flag (flag name)	This flag means
Cc (Can't Compress)	The file won't be compressed because of limited space savings.
Co (Compressed)	The file is compressed.
M (Migrated)	The file has been migrated.

NDIR Restriction Options

Option (option name)	Use to
[NOT] (Not)	View all files except those the option specifies. Example: /CR [NOT] BEF EQ AFT <i>mm-dd-yy</i>
/CR BEF EQ AFT <i>mm-dd-yy</i> (Creation date)	View files created on, before, or after the date specified.
/AC BEF EQ AFT <i>mm-dd-yy</i> (Last access)	View file last accessed before, on, or after the date specified.
/AR BEF EQ AFT <i>mm-dd-yy</i> (Last archive)	View files last archived on, before, or after the date specified.
/UP BEF EQ AFT <i>mm-dd-yy</i> (Last update)	View files last updated on, before, or after the date specified.
/OW EQ <i>user</i> (Owner)	View files created by a specific user.
/SI GR EQ LE <i>number</i> (Size)	View files with byte sizes greater than, equal to, or less than a specified number.

Examples

- ◆ To view all files in the current directory, type

NDIR *.*

- ◆ To view the version of all .EXE files on drive Z:, type

NDIR Z:*.EXE /VER

- ◆ To view only directories on drive F:, type

NDIR F:*.* /DO

- ◆ To view rights for all files in the current directory, type

NDIR *.* /R

- ◆ To view the date of file RECORD.TXT, type

NDIR RECORD.TXT /DA

- ◆ To view detailed file information on RECORD.TXT, type

NDIR RECORD.TXT /D

- ◆ To view all Read Only files in SYS:PUBLIC, type

NDIR SYS:PUBLIC*.* /RO

- ◆ To search for all batch files on drive C:, type

NDIR C:*.BAT /SUB

- ◆ To search (from the root) all subdirectories on your current drive for TEXTUTIL.MSG, type

NDIR TEXTUTIL.MSG /S

- ◆ To view all files in the current directory that are not Read Only, type

NDIR *.* /NOT RO

- ◆ To view all files on the current directory by file size from smallest to largest, type

NDIR *.* /SORT SI

- ◆ To view all files in drive Z: by the most recent access date first, type

NDIR Z:.*.* /REV SORT AC

- ◆ To view all files updated before June 5, 1991, type

NDIR *.* /UP BEF 6-05-91

- ◆ To view all files not owned by user PAT, type

NDIR *.* /OW NOT EQ PAT.SALES



You must type the user's complete name.

- ◆ To find where COMMAND.COM is located, type

NDIR COMMAND.COM /FI

Additional Information

Topic	See
Complete name	"Context" in <i>Concepts</i> .
Transactional attribute	"Attributes" in <i>Concepts</i> .
File and directory attributes	"Attributes" in <i>Concepts</i> . "FLAG" (page 79).

NETADMIN

Purpose

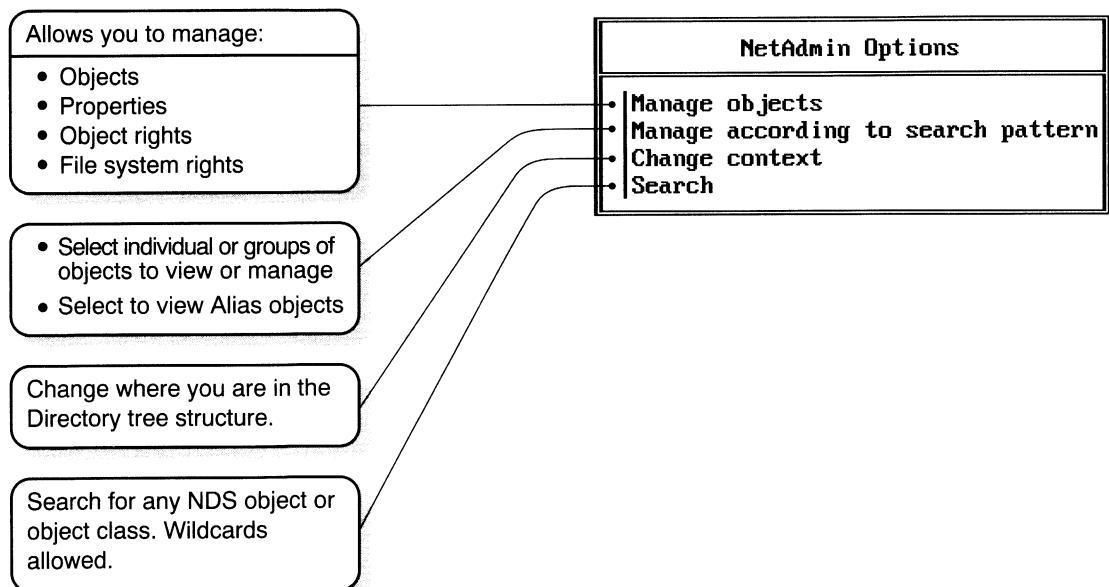
Use at a workstation to manage NetWare Directory Services (NDS) objects and their properties. Users can view, create, move, delete, and assign rights to any NDS object under their jurisdiction.



You can't manage printing and file system environments from NETADMIN. Use PCONSOLE and FILER, respectively.

Figure 2-7 shows the functions you can select from the "NetAdmin Options" main menu.

Figure 2-7
NETADMIN
Functions



Syntax

NETADMIN [/VER]

Parameter	Use to
/VER	View the version number of the utility and the list of files it uses to execute.



For help with tasks, press <F1> while you are in the utility.

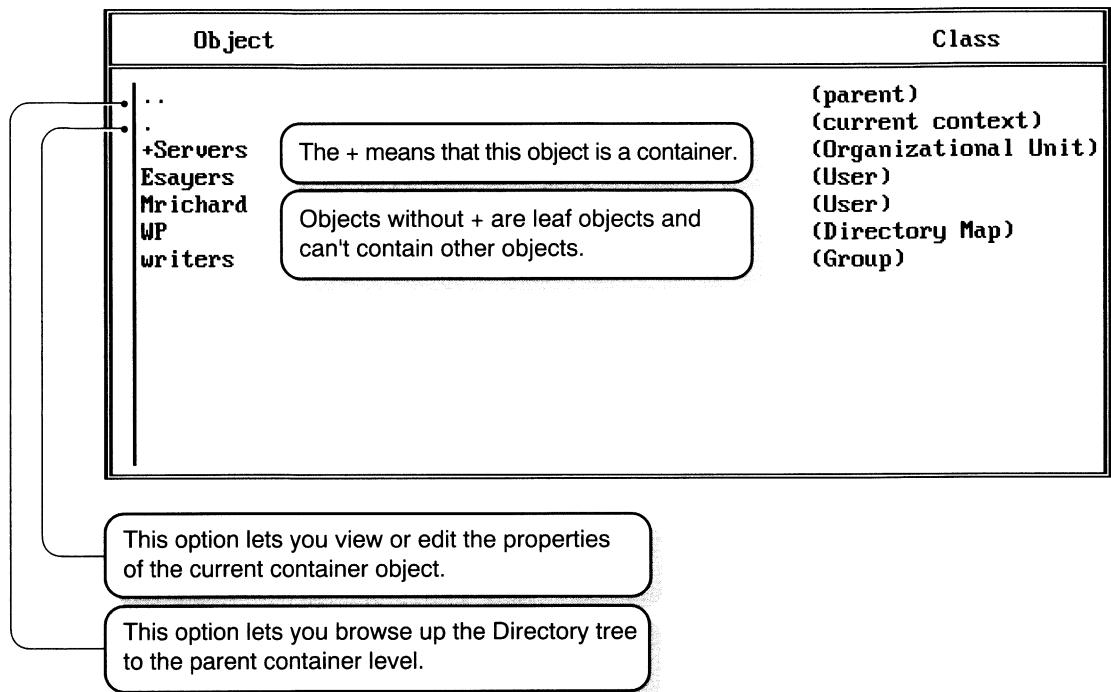
Using NETADMIN

NETADMIN displays information in windows, representing layers of the Directory tree. You can select the level of the tree in either of two ways: browsing the tree or choosing "Search" from the main menu.

Using the Browse Screen

Browsing is selecting objects to work with by moving through the Directory tree. As shown in the following figure, you select a container and press <Enter> to open it. When you have found the object you want, highlight it and press <F10> to view the available options.

Figure 2-8
NETADMIN Browse
Screen



Use the following table as a guide in browsing the tree..

To	Do this
Browse up the Directory tree to the parent container	Choose “.. (parent).”
View or edit the properties of the current container object	Select “. (current context)” and press <F10>.
Browse down the Directory tree	Choose objects with a plus (+) in front of them. When you choose a container object, you can see the objects in that container.
View or modify an object's properties	Press <F10> on the object.

Searching for an Object

You can define where and what you want to search for. The following figure shows elements that can be defined for a search.

Figure 2-9
Search Criteria

Search	
Context:	
Search Depth:	All containers in all sub-trees
Class:	/All classes/
Property:	
Operator:	
Value:	

Highlight each field to define the required criteria and press <Enter>. When all fields are defined properly, press <F10> to start the search. All objects found are displayed in a new window.

Select the appropriate object and press <Enter>. From the "Actions for:" menu, select "View or Edit Properties" or "View or Edit Trustees of This Object."

Managing Object Properties

All objects have properties that define them. Some properties are mandatory. You must specify their values before the object can be created. (Mandatory properties are listed on the screen where you create a new object.)

Other properties are optional; they help define the object or help you search for an object.

The following screen appears when you press <F10> to view or edit an object's properties. The last name and login name are mandatory for the User object.

Figure 2-10
User Properties

Identification information	
Login Name:	scott
Last name:	jones
Other name:	↓ (Empty List)
Title:	↓ (Empty List)
Description:	
Telephone:	↓ (Empty List)
Fax number:	↓ (Empty List)
Location:	↓ (Empty List)
Department:	↓ (Empty List)

The arrow indicates that there can be more than one item for this field.
Select this field and press <Enter> to view the list.

Assigning Rights

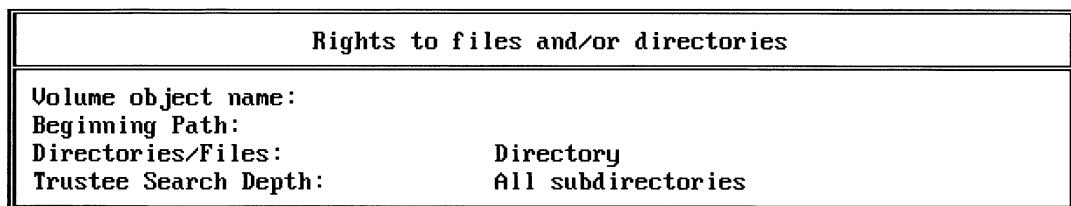
After you select an object, you can view or change access rights by

- ◆ Changing that object's rights to files on a volume
- ◆ Changing who has rights to view or change the properties of that object

Rights to Files and Directories

To make trustee assignments, you must choose the level of the Directory tree you want. Figure 2-11 shows the window where you will make this choice.

Figure 2-11
View or Edit
Object's Rights



- ◆ After you select a volume object and its path, all of the object's trustee assignments in that directory are listed. You can change the rights granted, or add or remove other trustee assignments.
- ◆ You must have the Access Control right to a file or directory to change an object's rights to it.
- ◆ For procedures to perform these tasks, press <F1> in the utility.

Rights to Objects

If you select “View or Edit the Trustees of this Object” from the “Actions for Organizational Role:” menu, and then select “Trustees,” the following screen appears, listing all trustee assignments that grant rights to access this object and its properties.

- ◆ You can change the rights that any trustee has to this object, or add and delete trustee assignments from the list.
- ◆ You can also view or change the Inherited Rights Filter of the object, if you have sufficient rights.

Figure 2-12
Trustee
Assignments

Property	Rights	Trustee
Login Script	[RW]	Admin
Message Server	[R]	[Public]
[All Property Rights]	[R]	Admin
[Object Rights]	[B]	[Root]

Example: Assigning Rights to Objects and Properties

If you press <Ins> at the screen shown in the previous figure, the following screen appears, allowing you to select a property (or the object) that a new trustee should be granted rights to.

Figure 2-13
Property List

Properties	
	[All Properties Rights]
	[Object Rights]
	Account Balance
	Account Disabled
	Account Has Expiration Date
	Account Locked
	Account Reset Time
	Allow Unlimited Credit
	Allow User To Change Password
▼	Authority Revocation

To change the trustees who have rights to it, you must have at least the Write property right to the ACL property of this object. (For procedures to perform these tasks, press **<F1>** while you are in the utility.)

Creating User Templates

If you need to create many users in the same container who need some of the same information in their properties, you can create a user template.

A user template is an object that contains default information that you can apply to users when you create them. This makes creating a large number of users easier.

You can create a user template in any Organization or Organizational Unit. When you create an Organization or Organizational Unit, you are asked if you want to create a user template.

Press **<F1>** to get more information.

Examples

Create Objects



1. Select “Manage Objects”; browse the Directory tree and select the container object where the new object will be located.
2. Press <Ins> and select the object type.
3. Press <F1> for help from here.

Edit User Password Expiration Date



1. Select “Manage Objects”; highlight the user object and press <F10>.
2. Select “View or Edit Properties of This Object”; select “Account Restrictions”; then select “Password Restrictions” from the menu.
1. Press <F1> for help from here.

Manage Directory and File Rights for an Object



1. Select “Manage Objects”; highlight the object and press <F10>.
2. Select “View or Edit This Object’s Rights to Files and Directories.”
1. Press <F1> for help from here.

Manage Other Objects’ Rights for an Object



1. Select “Manage Objects”; highlight the object and press <F10>.
2. Select “View or Edit Trustees of This Object.”
3. Press <F1> for help from here.

Modify Object Properties

Procedure 

1. Select “Manage Objects”; highlight the object whose properties you want to modify and press <F10>.
2. Select “View or Edit Properties of This Object”; select the property to modify, such as “Groups,” “Login Script,” “Account Restrictions,” etc., from the menu.
3. Press <F1> for help from here.

Move Objects to Another Location in the Directory Tree

Procedure 

1. Select “Manage Objects”; highlight the object you want to move and press <F10>.
2. Select “Move” from the menu.
3. Press <F1> for help from here.

Additional Information

Topic	See
Objects	“Object” in <i>Concepts</i>
	Appendix A, “NDS and Bindery Objects and Properties” (page 455).
User template	“User template” in <i>Concepts</i> .
Container objects	“Container object” in <i>Concepts</i> .
Leaf objects	“Leaf objects” in <i>Concepts</i> .
Context	“Context” in <i>Concepts</i> .

NETSYNC3

Purpose

Load at a NetWare 3 file server console to enable the NetWare Bindery Synchronizer.



You need to load NETSYNC4 on the NetWare 4.1 server before loading NETSYNC3 on the NetWare 3 servers.

- ◆ Copies (uploads) the NetWare 3 server's bindery information to the NetWare 4.1 server's bindery context, and then continues to communicate with the NetWare 4.1 server in order to receive updates to Directory information.
- ◆ Moves printing objects and converts the NetWare 3 PRINTDEF database into a NetWare 4.1-compatible database.
- ◆ Creates a working directory (NETSYNC) for the NetSync™ log files under SYS:SYSTEM.
- ◆ NETSYNC3 should run continuously, so you should add it to the AUTOEXEC.NCF file on the NetWare 3 server.

Syntax

LOAD NETSYNC3



For help with tasks, press <F1> in the utility.

Additional Information

For information on	See
Installing and Using NETSYNC3	<i>Installing and Using NetSync.</i>

NETSYNC4

Purpose

Load at the NetWare 4.1 “host” server console to enable the NetWare Bindery Synchronizer.

- ◆ Authorizes NetWare 3 servers to be part of the NetSync cluster.
- ◆ Receives information from the NetWare 3 binderies in its cluster, and then continually copies (downloads) updated Directory information to all of the attached NetWare 3 servers.

Syntax

LOAD NETSYNC4



For help with tasks, press <F1> in the utility.

Additional Information

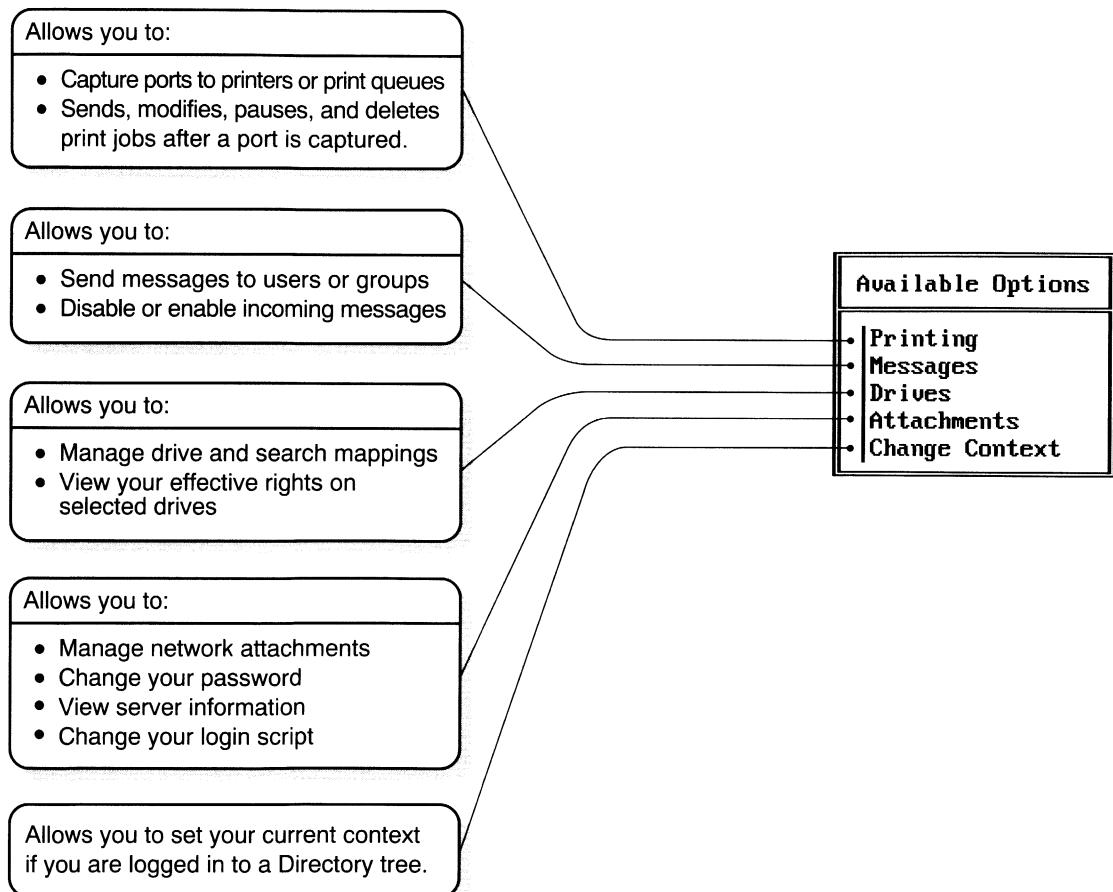
Topic	See
Installing and Using NETSYNC4	<i>Installing and Using NetSync.</i>

NETUSER

Purpose

Use at a workstation to manage network tasks.

Figure 2-14
NETUSER Functions



Syntax

NETUSER [/VER]

Parameter	Use to
/VER	View the version number of the utility and the list of files it uses to execute.

Note 

For help with tasks, press **<F1>** in the utility.

Examples

Capture a Printer

Procedure 

1. Select “Printing.”
2. Select the printer port from the available list.
3. Select “Change Printers.”
4. Press **<F1>** for help from here.

Print a Job

Procedure 

1. Select “Printing.”
2. Select “Print Jobs.”
3. Press **<F1>** for help from here.

Send Messages

Procedure 

1. Select "Messages."
2. Select "Send Messages to Users" or "Send Messages to Groups."
3. Press **<F1>** for help from here.

Map a Drive

Procedure 

1. Select "Drives."
2. Select "Drive mappings" or "Search mappings."
3. Press **<F1>** for help from here.

Change a Password

Procedure 

1. Select "Attachments."
2. Select the NetWare server and the username for which you want to change the password.
3. Select "Password."
4. Press **<F1>** for help from here.

Attach to a NetWare Server

Procedure 

1. Select "Attachments"; press **<Alt><F1>** to display more options at the bottom of the screen.
2. Press **<Ins>** to display a list of available servers.
3. Press **<F1>** for help from here.

Additional Information

Topic	See
NetWare User Tools in DOS	"Understanding Client Tools" in Chapter 3 of <i>NetWare Client for DOS and MS Windows User Guide</i> .

NetWare Administrator

Purpose

Use at a workstation to perform in Microsoft* Windows (MS Windows) or OS/2 the supervisory tasks that are available in FILER, NETADMIN, PARTMGR, and PCONSOLE. You can

- ◆ Create users and groups
- ◆ Create and delete Directory Services objects
- ◆ Move and rename Directory Services objects
- ◆ Assign rights in the Directory tree and in the file system
- ◆ Set up printing services
- ◆ Set up and manage Directory Services partitions and replicas

Starting NetWare Administrator

During installation, files for the MS Windows NetWare Administrator are copied to the SYS:PUBLIC directory. For the OS/2 NetWare Administrator, the files are copied to the SYS:PUBLIC/OS2 directory.

Before you use the NetWare Administrator for the first time in MS Windows or OS/2, create an NWADMIN icon. Thereafter, you can choose the icon to start the utility.

For instructions, see “Installing an MS Windows Workstation and Starting NetWare Administrator” or “Installing an OS/2 Workstation and Starting NetWare Administrator” in Chapter 1 of *Supervising the Network*.

Using NetWare Administrator

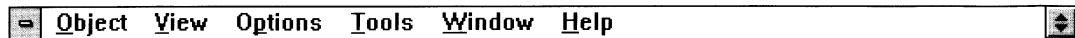
NetWare Administrator has a graphical user interface (GUI) and runs as a multiple-document interface (MDI) application.



For help in NetWare Administrator, choose the Help button on the screen, press <F1>, or use the pull-down Help menu.

Using the Menu Bar

The menu bar displays headings for several menus. To complete a task, you first select an object in the browser, next select a menu heading, and then choose the option you want to use in the menu.



Each time you select a menu option, a message appears in the title bar explaining briefly what the menu option does. If an option is grayed, it is not available for the object you selected.

Using the Browser

When you launch NetWare Administrator, you will notice that its primary window is a browser that displays the NetWare Directory Services (NDS) container objects and leaf objects at your current context in the Directory tree.

You can open up to nine additional browsers. You might want to open an additional browser to see a different context in the Directory tree.

To open another browser, select a container object (this will be the root object in the browser window) and, from the "Tools" menu, select "Browser."

Working with Objects

- ◆ To view the file system of a server in your tree,
 - ◆ Double-click on the Volume object associated with that server

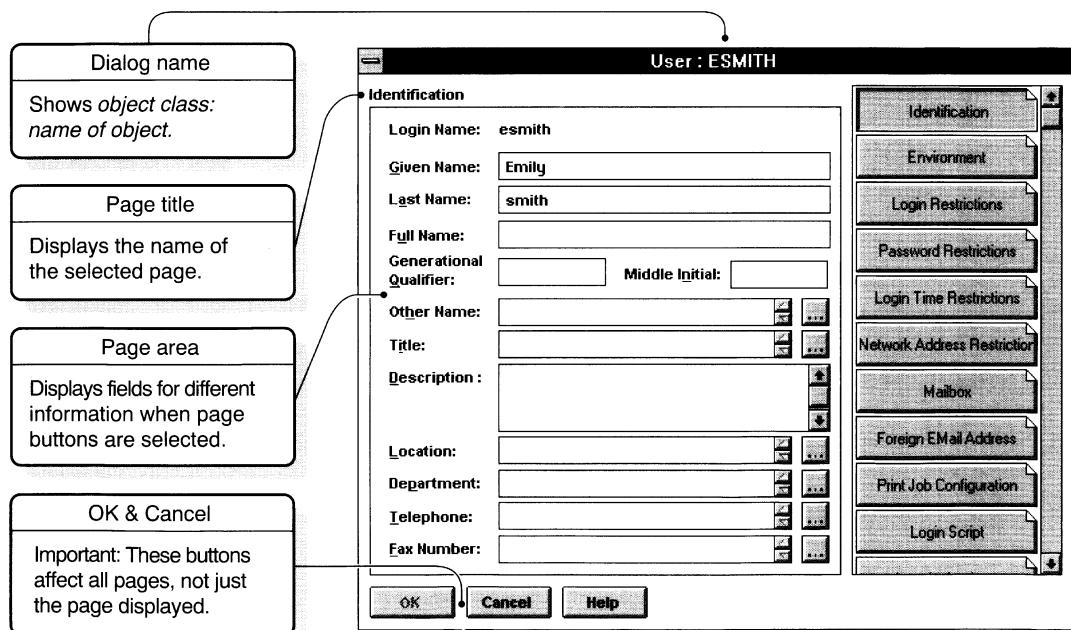
For example, to see the file system in the SYS: volume of server KATT, double-click on the Volume object KATT_SYS.
- ◆ To open a container object and view the objects in it
 - ◆ Double-click anywhere on the container object's name or icon.
 - ◆ Select the container object and, from the "View" menu, choose "Expand."
- ◆ To view the object dialog (object details) of a container object
 - ◆ Select the container object and from the "Object" menu, choose "Details."
 - ◆ Select the container object, right-click once, and choose "Details" from the short menu that appears.
- ◆ To view the object dialog (object details) of a leaf object
 - ◆ Select the leaf object and double-click.
 - ◆ Select the leaf object and from the "Object" menu, choose "Details."
 - ◆ Select the leaf object, right-click once, and choose "Details" from the short menu that appears.

Using the Object Dialog

The object dialog allows you to view and edit information about an object's properties. When you open an object dialog, you will notice that along the right side of the dialog are "pages" that you view one at a time. The pages are part of one dialog. When you select a different page, you're still in the same dialog.

The "Identification" page is the first page you see when you open an object dialog. Figure 2-15 shows the "Identification" page of a User object.

Figure 2-15
Identification Page



Additional Information

Topic	See
Creating container objects with NetWare Administrator	"Creating Container Objects" in Chapter 1 of <i>Supervising the Network</i> .
Creating leaf object with NetWare Administrator	"Creating Leaf Objects" in Chapter 1 of <i>Supervising the Network</i> .
Moving objects with NetWare Administrator	"Moving Objects in the Directory Tree" in Chapter 1 of <i>Supervising the Network</i> .
Assigning rights to the file system in NetWare Administrator	"Understanding File and Directory Rights" in Chapter 2 of <i>Supervising the Network</i> .
Assigning rights to NDS objects	"Managing Trustee Assignments to Objects" in Chapter 1 of <i>Supervising the Network</i> .
Printing in NetWare Administrator	Chapter 3, "Managing Print Services with the NetWare Administrator Utility" in <i>Print Services</i> .
Using Partition Manager in NetWare Administrator	"Creating and Managing Directory Services Partitions" in Chapter 5 of <i>Supervising the Network</i>

NLIST

Purpose

Use at a workstation to

- ◆ View information about objects such as users, groups, volumes, servers, etc.
- ◆ Search on objects and object properties

Syntax

```
NLIST [class type [property search option]  
[object name] [/basic option] [display option]] |  
[/? | /VER]
```

Parameter	Use to
<i>class type</i>	Specify an object type, such as USER, SERVER, PRINTER, GROUP, VOLUME, etc. (See “NDS Object Classes” on page 456.)
	For bindery servers (NetWare 3), replace <i>class type</i> with USER, SERVER, QUEUE, GROUP, or VOLUME.
	These are the only objects available in bindery services mode for NetWare 3.
<i>property search option</i>	Specify a search option. For online help, type NLIST /? R
<i>object name</i>	Specify the name of the object you want information about.
/basic option	Specify any available option. See “NLIST Options” on page 191.”
<i>display option</i>	Select how data is displayed. For online help, type NLIST /? D

Parameter	Use to
/?	View online help. All other parameters are ignored when /? is used.
/VER	View the version number of the utility and the files it uses to execute. All other parameters are ignored when /VER is used.

NLIST Options

Option	Use to
A	View users who are logged in.
B[= <i>server name</i>]	View information stored in the bindery of the specified server. (Bindery servers only.)
C	Scroll continuously through information.
CO[= <i>context</i>]	Set the context to be searched (NDS servers only).
D	View all object properties.
N	View object names.
S	Search all levels of the database, beginning at the current context.
SHOW[<i>property</i>]	View a specific property of an object.
TREE	View all tree names visible from this login.

Using NLIST

- ◆ Searching on objects and properties allows you to view specific groups of objects.

For example, you can view all users whose passwords will expire on a certain date. Or you can view all groups that have a particular user as a member.

- ◆ You can use Property groups only with a bindery connection, or with bindery services.
- ◆ USER, SERVER, QUEUE, GROUP, and VOLUME are the only objects you can search on in a bindery context.
- ◆ Table 2-3 shows the syntax for some of the most frequently used NLIST operations.

For detailed information on the parameters in this table, see the online help.

Table 2-3
NLIST Syntax

To list	Use this syntax
Any information	NLIST [class type] [=object name] [/option...]
User information	NLIST user=[username] [WHERE [property] [operator] [value]] [SHOW [property]] [/option...] For bindery servers, use [property group] instead of [property]
Server information	NLIST server=[server name] [WHERE [property] [operator] [value]] [SHOW [property]] [/option...] For bindery servers, use [property group] instead of [property]
Group information	NLIST group=[group] [WHERE [property] [operator] [value]] [SHOW [property]] [/option...] For bindery servers, use [property group] instead of [property]

Table 2-3
NLIST Syntax

To list	Use this syntax
Printer information	NLIST printer=[<i>printer</i>] [WHERE [<i>property</i>] [<i>operator</i>] [<i>value</i>]] [SHOW [<i>property</i>]] [/option...] For bindery servers, use [<i>property group</i>] instead of [<i>property</i>]
Print Queue information	NLIST queue=[<i>queue</i>] [WHERE [<i>property</i>] [<i>operator</i>] [<i>value</i>]] [SHOW [<i>property</i>]] [/option...]
Volume information	NLIST volume=[<i>volume</i>] [WHERE [<i>property</i>] [<i>operator</i>] [<i>value</i>]] [SHOW [<i>property</i>]] [/option...]
Object information	NLIST [<i>class type</i>] [=object name] [[WHERE <i>name</i> [<i>operator</i>] [<i>value1</i>] WHERE <i>object</i> [<i>operator</i>] [<i>value2</i>]] [/option...]]
Bindery object information	NLIST /OT [=value] [WHERE <i>name</i> [<i>operator</i>] [<i>value1</i>] WHERE <i>object</i> [<i>operator</i>] [<i>value2</i>]] [/option...]]

Examples

Users

- ◆ To list all users whose password length is less than 5, type


```
NLIST USER WHERE "PASSWORD MINIMUM LENGTH" LT 5
```
- ◆ To list all users whose accounts will expire by June 30, 1995, type


```
NLIST USER WHERE "ACCOUNT EXPIRATION" LE 06-30-95
```
- ◆ To list all users who are members of group MANAGERS, type


```
NLIST USER WHERE "GROUP MEMBERSHIP" = MANAGERS
```
- ◆ To list all users logged in, type


```
NLIST USER /A
```

- ◆ To list all users who have supervisor equivalence, type

NLIST USER WHERE "SECURITY EQUAL TO" = SUPERVISOR

- ◆ To list all properties of user CINDY, type

NLIST USER=CINDY /D

- ◆ To list all users managed by JOE (bindery users only), type

NLIST USER WHERE MANAGERS=JOE

- ◆ To list users logged in to the database, type

NLIST USER /A /S

- ◆ To list properties of users in the current context, type

NLIST USER /D

- ◆ To list the login script of every user who has a login script in all contexts, type

NLIST USER SHOW "LOGIN SCRIPT" /S

- ◆ To list users whose telephone numbers begin with 4 (search all subordinate containers), type

NLIST USER WHERE "TELEPHONE NUMBER" = 4* /S

- ◆ To list users at a context, type

NLIST USER /CO <context>

- ◆ To list telephone numbers of all users in the current context, type

NLIST USER SHOW "TELEPHONE NUMBER"

Servers

- ◆ To list servers running NetWare 4.1, type

**NLIST SERVER WHERE VERSION = "NOVELL NETWARE
4.10[DS]"**

Note 

If you don't know the version number of a server, use the SHOW option. In this case, you can use NLIST SERVER SHOW VERSION.

- ◆ To list the network address of server ACCT (search all subordinate containers), type

NLIST SERVER=ACCT SHOW "NETWORK ADDRESS" /S

- ◆ For bindery servers, type,

NLIST SERVER=ACCT SHOW "ATTACHMENT INFORMATION"

- ◆ To list servers in the current context, type

NLIST SERVER

- ◆ To search for servers in the Directory tree, type

NLIST SERVER /S

- ◆ To see if server ACCT is up, type

NLIST SERVER=ACCT /A

- ◆ To list servers whose name begins with L, type

NLIST SERVER = L*

Groups

- ◆ To list members of group TEMPORARY, type

NLIST GROUP=TEMPORARY SHOW MEMBERS

- ◆ To list groups with MSMITH as a member, type

NLIST GROUP WHERE MEMBER EQ MSMITH

- ◆ To list the owner of group RECORDS, type

NLIST GROUP=RECORDS SHOW OWNER

- ◆ To list all information about group RECORDS (bindery servers only), type

NLIST GROUP=RECORDS SHOW MISC

Printers

- ◆ To list operators for printer P1, type

NLIST PRINTER=Q1 SHOW OPERATOR

- ◆ To list users for printer P1, type

NLIST PRINTER=Q1 SHOW USER

- ◆ To list printers whose name begins with P, type

NLIST PRINTER WHERE NAME = P*

- ◆ To list printers in the current context and below, type

NLIST PRINTER /S

Print Queues (Bindery Servers)

- ◆ To list operators for print queue Q1, type

NLIST QUEUE=Q1 SHOW OPERATORS

- ◆ To list users for print queue Q1, type

NLIST QUEUE=Q1 SHOW USERS

- ◆ To list print queue names, type

NLIST QUEUE /N

Volumes

- ◆ To list host servers where all volumes beginning with A reside, type

NLIST VOLUME=A* SHOW "HOST SERVER"

- ◆ To list the bindery server where volume VOL1: resides, type

NLIST VOLUME=VOL1 SHOW SERVER

- ◆ To list the server running Directory Services where volume VOL1 resides, type

NLIST VOLUME=VOL1 SHOW "HOST SERVER"

Objects

- ◆ To list objects named MYSERVER, type

NLIST * WHERE NAME = MYSERVER

- ◆ To list objects in the current context, type

NLIST *

Additional Information

Topic	See
Current Context	“Context” in <i>Concepts</i> .
Properties	“Property” in <i>Concepts</i> .

NMENU

Purpose

Use at a workstation to access customized menus that have been created.

Syntax

NMENU *menu_name* [*/?*]

Parameter	Use to
<i>menu_name</i>	Specify the name of the .DAT menu file.
<i>/?</i>	View online help. All other parameters are ignored when <i>/?</i> is used.

Using NMENU

- ◆ You can only use NMENU when a menu file already exists.
- ◆ You must know the name and location of the menu file and have Read and File Scan rights to the directory containing the menu file.

Additional Information

Topic	See
Creating menu files	“Creating a Menu File” in Chapter 4 of <i>Supervising the Network</i> .

NPAMS

Purpose

Load on a NetWare 4.1 SFT III server to enable the mounting of a CD-ROM as a NetWare volume.

Syntax

LOAD NPAMS

Using NPAMS

- ◆ NPAMS (NetWare Peripheral Architecture™ Mirrored Server) is a custom device module that is required for mounting a CD-ROM as a NetWare SFT III volume.
- ◆ Load NPAMS in the MSEngine *after* loading the CD-ROM driver and the NetWare Peripheral Architecture driver (NPAIO.DSK) in the IOEngine.

Additional Information

Topic	See
Mounting a CD-ROM as an SFT III volume	“Mounting a CD-ROM as a NetWare 4.1 SFT III Volume” in Appendix C of <i>Supervising the Network</i> .

NPATH

Purpose

Use at a workstation to view the NetWare search sequence for a file.

This information helps you troubleshoot why your station can't find a particular file, why it's finding an incorrect version of the file, or why it's displaying a foreign language.

Syntax

```
NPATH [utility][filename[,filename...]] [/option...]  
[/? | /VER]
```



When you view your workstation's search sequence for a file, include the name of the utility in the command. The search sequence depends on the drive and directory that the utility is executed from.

Parameter	Use to
<i>utility</i>	Specify the name of the utility you are trying to execute.
<i>filename</i>	Specify either the message or the Unicode* filename (and its extension) that your workstation either can't find or can't find the correct version of.
<i>/option</i>	Replace <i>option</i> with any available option. See "NPATH Options" on page 203.
/?	View online help. All other parameters are ignored when /? is used.
/VER	View the version number of the utility and the files it uses to execute. All other parameters are ignored when /VER is used.

Using NPATH

- ◆ Use NPATH when you try to execute a utility and have one of these problems:
 - ◆ You get a message that you're missing a message file (either an .MSG, .HEP, .IDX, or .XLT file), or a Unicode file. This message identifies the file you're missing.
 - ◆ You get a message that you have an incorrect version of a message file (an .MSG, .HEP, .IDX, or .XLT file). This message shows the version of the file your workstation found, and the version you need.
 - ◆ You get a foreign language displayed on your screen.
 - ◆ Your workstation does not find a particular file in its search sequence.
- ◆ To find your workstation's file search sequence for message files, use NPATH with no parameters.
- ◆ If you include a filename in the command, NPATH displays the path to the first occurrence of the file in the search sequence.
- ◆ To search for multiple files at the same time, separate the filenames with commas.
- ◆ A Unicode file without an extension defaults to the country code.
- ◆ Unicode files are not required to run NPATH. NPATH runs without a message file if the correct file is not available.
- ◆ The way the file search sequence is designed for NetWare utilities, the same path may be looked at more than once.

NPATH Options

Option (option name)	Use to
A (All)	List the path to all occurrences of the file you specify.
D (Details)	View the language, version number, date, and time of the file you specify.
/Uni /D (Unicode details)	View the code page and country code your workstation is set to, the Unicode files needed to run the NetWare utility, and the path to the first occurrence of each file. Does not require a filename.
Uni (Unicode)	List all paths to Unicode files.

Troubleshooting with NPATH

If	Do the following
You get a message that you're missing a file but you know the file is located in a particular directory	<ol style="list-style-type: none">1. Map a search drive to the directory that the file is in. (To make the search drive permanent, add it to your login script.)2. Use NPATH if you want to confirm that your workstation can now find the file in its search sequence.
You get a message that you're missing a file and you don't know where the file is located	<ol style="list-style-type: none">1. Check the PUBLIC\NLS\<language> directory.2. Use NDIR to locate the directory that the file is in if it's not in the PUBLIC\NLS\<language> directory.3. Use NWXTRACT to get the file from diskette or CD if the file isn't on any of your drives (if it's not in PUBLIC\NLS\<language> and NDIR can't find it).4. Map a search drive to the directory that the file is in. (To make the search drive permanent, add it to your login script.)5. Use NPATH to confirm that your workstation can now find the file in its search sequence.

If	Do the following
You get a message that you have the incorrect version of a file	<ol style="list-style-type: none"> 1. Use NPATH to view the search sequence your workstation is using to find each occurrence and version number of the file. 2. Identify whether the version of the file you need is in the search sequence. <p>Note: If your workstation finds an older version of a file in the search sequence before it finds a newer version, the older version is the one your workstation loads.</p> <ol style="list-style-type: none"> 3. Run the utility from the directory that the version you need is in if that version is displayed in the search sequence, or copy the file to your current directory. 4. Use NWXTRACT to get the file from diskette or CD if the version you need is not in the search sequence. 5. Use NPATH if you want to confirm that your workstation can now find the correct version (before any other versions) in its search sequence.
You get a foreign language displayed on your screen	<ol style="list-style-type: none"> 1. Change your NWLANGUAGE environment variable to your native language. 2. Use the SET NWLANGUAGE = command in the AUTOEXEC.BAT file. 3. Use NPATH to confirm that your workstation can now find your native language message files in its search sequence.

Examples

- ◆ To view your workstation's search sequence for message files, type

NPATH

- ◆ To view the path to the first occurrence of NCOPY.MSG found in the search sequence, type

NPATH NCOPY NCOPY.MSG

- ◆ To view the path to each occurrence of FILER.MSG found in the search sequence, type

NPATH FILER FILER.MSG /A

- ◆ To view the path to the first occurrence of SEND.HEP found in the search sequence, as well as its language, version number, date, and time, type

NPATH SEND SEND.HEP /D

- ◆ To view the path to each occurrence of BIND.VLM in the search sequence, type

NPATH BIND.VLM /A

- ◆ To view the path to each occurrence of TEXTUTIL.MSG (for NETADMIN) found in the search sequence, as well as each file's language, version number, date, and time, type

NPATH NETADMIN TEXTUTIL.MSG /A /D

- ◆ To view your workstation's search sequence for the Unicode files needed to execute FLAG, type

NPATH FLAG /Uni

- ◆ To view which code page and country code your workstation is set to, the Unicode files needed to execute RIGHTS, and the path to the first occurrence of each Unicode file found in the search sequence, type

NPATH RIGHTS /Uni /D

- ◆ To view the path to the first occurrence of UNI_MON.001 found in the search sequence, type

NPATH UNI_MON.001 /Uni

- ◆ To view the path to each occurrence of UNI_MON.001 found in the search sequence, type

NPATH UNI_MON.001 /Uni /A

- ◆ To view the code page and country code your workstation is set to, the Unicode files your workstation needs to run NetWare utilities, and the path to each occurrence of each file, type

NPATH /Uni /D /A

Additional Information

Topic	See
Unicode files	“Unicode” in <i>Concepts</i> .
Search drive mappings	“Drive mapping” in <i>Concepts</i> . “Search drive” in <i>Concepts</i> .
NetWare utilities’ search sequence	“Search algorithm” in <i>Concepts</i> .

NPRINT

Purpose

Use at a workstation to print plain text files or files from outside an application.

Syntax

```
NPRINT filename [P=printername | Q=queuename]  
[/option...] [/? | /VER]
```

Additional Information

Topic	Refer to
Using NPRINT	“Using NPRINT” in Chapter 5 of <i>Print Services</i> .

NPRINTER.EXE

Purpose

Use at a workstation to attach a printer to a workstation.

Command Syntax

NPRINTER *printername* [*/options...*]

or

NPRINTER *printservername* *printernumber* [*/options...*]

Additional Information

Topic	See
Using NPRINTER.EXE	Chapter 7, “Setting Up Printers Attached to Workstations or Servers” in <i>Print Services</i> .

NPRINTER.NLM

Purpose

Use to attach a printer to a NetWare server.

Multiple NPRINTER.NLMs can be loaded on a NetWare server.

Syntax

LOAD NPRINTER *printername*

or

LOAD NPRINTER *printservername printernumber*

Additional Information

Topic	See
Using NPRINTER.NLM	Chapter 7, “Setting Up Printers Attached to Workstations or Servers” in <i>Print Services</i> .

NVER

Purpose

Use at a workstation to

- ◆ View version information for the workstation and attached servers
- ◆ View Novell OS/2 Requester version information for OS/2 and attached servers

Syntax

NVER [/C] [/? | /VER]

Parameter	Use to
/C	Scroll continuously through information.
/?	View online help. All other parameters are ignored when /? is used.
/VER	View the version number of the utility and the files it uses to execute. All other parameters are ignored when /VER is used.

NWXTRACT

Purpose

Use at a workstation to extract and copy files from CD-ROM or from the installation diskettes to the network or to local drives.

Syntax

```
NWXTRACT path filename | groupname [destination]  
[/option...] [/? | /VER]
```

Parameter	Use to
<i>path</i>	Specify the path to the master data file (FILES.DAT). Note: Master data files are language-specific and are located in their respective language subdirectories in the Directory tree. For example, the master data file for English (FILES.DAT) is located in the \NETWARE.40\ENGLISH directory.
<i>filename</i>	Specify the name of the file you want to extract.
<i>groupname</i>	Specify the name of the group of files you want to extract. A list of group names is available in online help.
<i>destination</i>	Specify the path where you want the extracted files copied to (if you don't want them copied to the directories they were copied to at installation).
<i>/option</i>	Replace <i>option</i> with any available option. See "NWXTRACT Options" on page 213.

Parameter	Use to
/?	View online help. All other parameters are ignored when /? is used.
/VER	View the version number of the utility and the files it uses to execute. All other parameters are ignored when /VER is used.

NWXTRACT Options

Option	Use to
S=server <i>server object</i>	Copy files to their normal location on the specified server.
T= <i>type</i>	Specify the type of file to be extracted. Types: DOS, MAC, OS2, SER (server), UNX, WIN.

Examples

- ◆ To extract FILER.EXE from the diskette and put it in the normal location on server ACCT, type

NWXTRACT A:FILER.EXE /S=ACCT

- ◆ To extract NCOPY.MSG from the diskette and put it on drive C, type

NWXTRACT A:NCOPY.MSG C

- ◆ To extract the OS/2 FILER.EXE from the diskette and put it in the normal location on server ACCT, type

NWXTRACT A:FILER.EXE /S=ACCT /T=OS2

OFF

OFF

Purpose

Use at the server console to clear the console screen. (You can also use CLS to clear the screen.)

Syntax

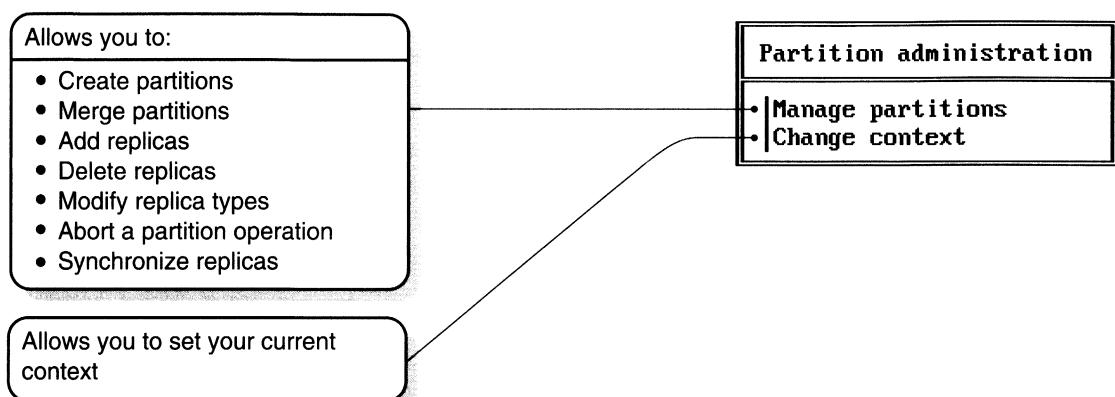
OFF

PARTMGR

Purpose

Use at a workstation to manage partitions and their replicas.
Figure 2-16 shows the functions available in PARTMGR.

Figure 2-16
Functions in
PARTMGR



Syntax

PARTMGR [/VER]

Parameter	Use to
/VER	View the version number of the utility and the list of files it uses to execute.



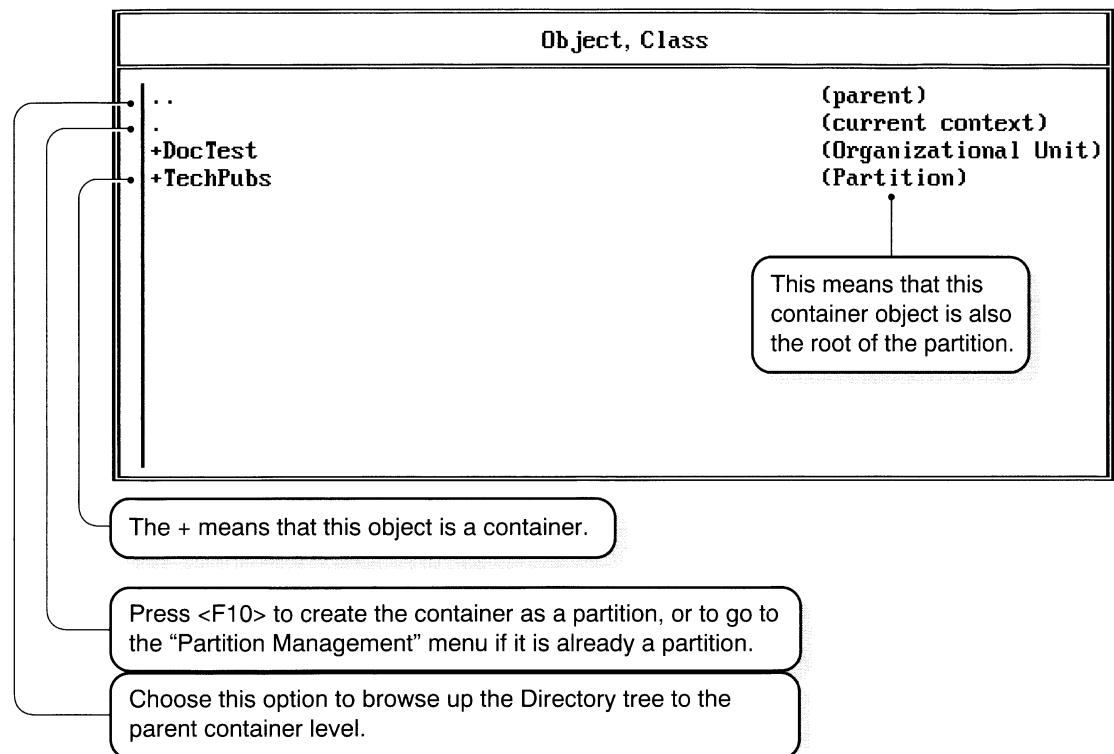
For help with tasks, press <F1> in the utility.

Using PARTMGR

Using the PARTMGR Browser

Figure 2-17 shows the PARTMGR browser that opens when you choose “Manage Partitions” from the “Partition Administration” menu.

Figure 2-17
The PARTMGR
Browser



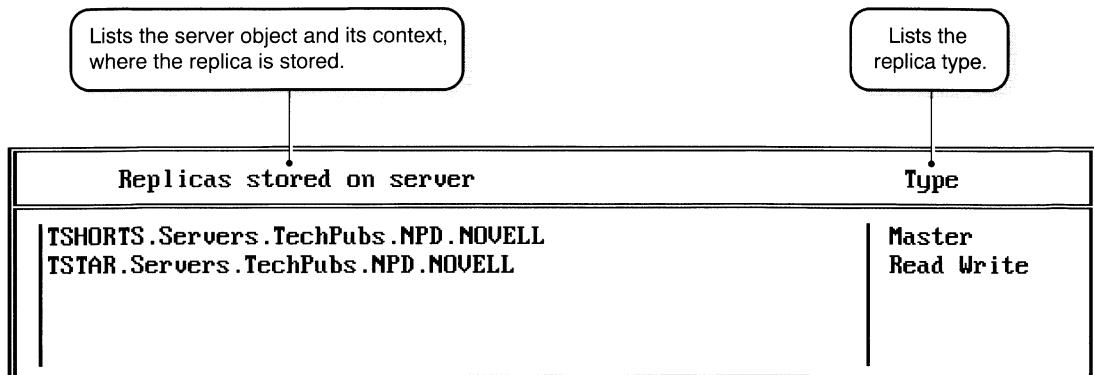
- ◆ To browse up the Directory tree to the parent container, choose “.. (parent).”
- ◆ To view or edit the replicas of the current container object (if that container object is a partition), select “. (current context)” and press <F10>.
- ◆ To browse down the Directory tree, choose objects with a plus (+) in front of them. When you choose a container object, you can see the objects in that container.
- ◆ To create a new partition with a container object as the root of the partition, press <F10> on the container that you want to be the root of the partition.
- ◆ To view or modify a partition’s replicas, to merge a partition with its parent partition, or to abort a partition operation that’s in progress, select the partition and press <F10>.
- ◆ Objects that don’t have a plus (+) sign are servers. To see a list of the replicas stored on a server, select a server object and press <F10>.

Managing Replicas

Replicas are copies of the information in the partition. They are stored on servers in the Directory tree. There are four types of replicas: master read/ write, read-only, and subordinate. For an explanation of replica types, see “Replica” in *Concepts*.

Figure 2-18 shows the replica list, which includes the servers where the replicas are stored.

Figure 2-18
Replicas Stored on
a Server



Examples

Merge Partitions

Procedure 23

1. From the PARTMGR menu, select "Manage Partitions" and browse the Directory tree to select the partition you want to merge with its parent.
2. Press <F10> and select "Merge with Parent Partition."
3. Press <F1> for help from here.

Create Partitions

Procedure 23

1. From the PARTMGR menu, select "Manage Partitions" and browse the Directory tree to select the container you want to be the root object for the partition.
2. Press <F10>.
3. Press <F1> for help from here.

View or Manage Replicas

Procedure 

1. From the PARTMGR menu, select “Manage Partitions” and browse the Directory tree to select the partition whose replicas you want to manage.
2. Press <F10> and select “View/Edit Replicas.”
3. To manage replicas, press <F10>.
4. Press <F1> for help from here.

Additional Information

Topic	See
Partitions	“Partition (NetWare Directory)” in <i>Concepts</i> .
Replicas	“Replica” in <i>Concepts</i> .
Partition and replica operations	Chapter 5, “Managing the NetWare Directory Tree” in <i>Supervising the Network</i> .

PCONSOLE

Purpose

Use at a workstation to

- ◆ Create, assign, modify, delete, and monitor print queues, print servers, and printers
- ◆ Send, monitor, modify, pause, resume, and delete print jobs
- ◆ Quickly install basic print services using Quick Setup
- ◆ Enable and view the print server auditing log
- ◆ Change your NetWare Directory Services context

P_{CONSOLE} is the primary administrative utility for NetWare print services. NetWare Administrator provides functionality in the graphical environment similar to that provided by P_{CONSOLE} in a menu environment.

Syntax

PCONSOLE

Additional Information

Topic	See
Using P _{CONSOLE}	Chapter 4, “Managing Print Services with P _{CONSOLE} ” in <i>Print Services</i> .

PING

Purpose

Use at the server console to send an Internet Control Message Protocol (ICMP) echo request packet to an IP node on your internetwork.

PING determines whether an IP node is reachable on your internetwork.

Syntax

LOAD PING

Using PING

- ◆ PING sends an ICMP echo request packet to an IP node on your internetwork. If the target node receives the packet, it sends back a reply packet.
- ◆ To select an IP node, enter its hostname or IP address in the “Host Name” field.
You can also specify the number of seconds between each packet transmission and the size of the packet, in bytes.
- ◆ To start sending packets, press **<Esc>**. The sending node continues to send request packets and collect response time statistics until you press **<Esc>** again to exit PING.
- ◆ To select additional IP nodes, press **<Ins>**. Enter the hostname or IP address of the node in the “Host Name” field. Press **<Esc>** to start sending packets.

Additional Information

Topic	See
IP protocol	<i>NetWare TCP/IP Reference.</i>
IP addressing	<i>NetWare TCP/IP Reference.</i>

PMMON

Purpose

Use on a NetWare Server for OS/2 to monitor OS/2 and NetWare Server for OS/2 CPU use to allocate memory and to set performance tuning levels on a NetWare Server for OS/2.

Syntax

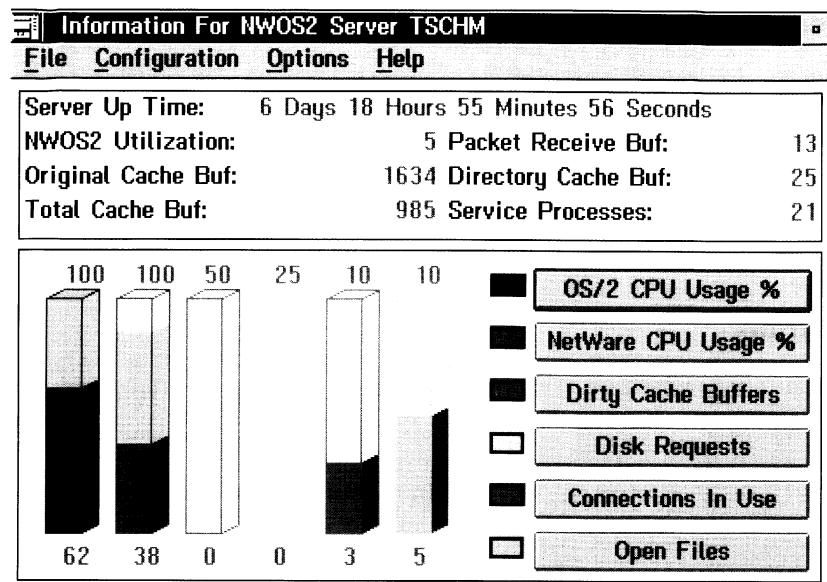
- ◆ From within the Novell group on your OS/2 desktop, double-click on the “PMMON” icon.
- ◆ From the command line in an OS/2 window or full screen session, change to the \NWOS2 directory and type

PMMON

An example of the PMMON main screen is shown in the following figure.

PMMON

Figure 2-19
The PMMON Main Screen



For help in PMMON, you can either press **<F1>**, use the pull-down Help menu, or click on the Help buttons.

Using PMMON

- ◆ PMMON tracks many of the same server statistics for NetWare Server for OS/2 as does MONITOR for regular NetWare 4.
- ◆ MONITOR should be used in most cases for monitoring NetWare Server for OS/2. However, you should always use PMMON, rather than MONITOR, to monitor CPU utilization between OS/2 and NetWare Server for OS/2 because it is more accurate. For example, the server CPU usage may always read 100% in MONITOR and information about OS/2 CPU usage may not be gathered correctly.

- ◆ The following statistics are gathered and displayed in PMMON:
 - ◆ NetWare Server for OS/2 use
 - ◆ Original, total, dirty, and directory cache buffers
 - ◆ Packet receive buffers
 - ◆ Service processes
 - ◆ Percent of OS/2 CPU and NetWare CPU use
 - ◆ Disk requests
 - ◆ Connections in use
 - ◆ Number of open files

Additional Information

Topic	See
Using PMMON to monitor NetWare Server for OS/2, set processing time, and set memory sharing options	Appendix B, "Managing NetWare Server for OS/2" in <i>Supervising the Network</i> .

PRINTCON

Purpose

Use to create or modify print job configurations to specify a default printer and other options for users who use CAPTURE, NPRINT, NETUSER, or PCONSOLE.

PRINTCON also allows you to change your current User or container object (in NetWare Directory Services) or your NetWare server (in bindery mode).

Syntax

PRINTCON

Additional Information

Topic	See
Using PRINTCON	Chapter 8, “Creating and Managing Print Job Configurations” in <i>Print Services</i> .

PRINTDEF

Purpose

Use to view, modify, import, or export print device definitions and to monitor, modify, or create printer forms.

Syntax

PRINTDEF

Additional Information

Topic	See
Using PRINTDEF	Chapter 9, “Working with Print Device Definitions and Printer Forms” in <i>Print Services</i> .

PROTOCOL

Purpose

Use at the server console to

- ◆ View the protocols registered on your NetWare server
- ◆ Register additional protocols and frame types

Syntax

PROTOCOL [REGISTER *protocol frame id#*]

Parameter	Use to
(no parameter)	Display the protocols registered on your server.
REGISTER	Register a protocol. It is only necessary to use PROTOCOL REGISTER in unusual cases, such as when using a new media.
<i>protocol</i>	Specify the protocol name.
<i>frame</i>	Specify the name representing the frame type that is to be bound to the communication protocol.
<i>id#</i>	Specify the protocol identification number (also called a protocol ID, PID, an Ethernet type or E-type, or an SAP). This number is a unique, assigned hexadecimal number that tells the server how to recognize data coming from a certain network board through a designated communication protocol (such as IPX).

Using PROTOCOL

- ◆ LAN drivers automatically register IPX; other protocol stacks register themselves.
- ◆ For approved protocol loadable modules, consult your reseller. For the protocol name, check the documentation that comes with the protocol module.
- ◆ LAN drivers automatically register a frame type when they are loaded. If the LAN driver supports more than one frame type, the frame type is registered when you load the driver with that frame type.

Additional Information

Topic	See
Binding protocols to a LAN driver	"Load the LAN Drivers" in Chapter 2 of <i>Installation</i> . "BIND" (page 15).

PSC

Purpose

Use at a workstation to perform tasks that you might otherwise perform in PCONSOLE. Specifically, use PSC to

- ◆ View network printer information
- ◆ Control network printers
- ◆ Control the print server

Syntax

PSC **ps=***printserver* **p=***printer* [*/option...*] [**/?** | **/VER**]

Additional Information

Topic	Refer to
Using PSC	"Using PSC" in Chapter 10 of <i>Print Services</i>

PSERVER

Purpose

Use to monitor and manage printers and print queues.



Multiple PSERVER modules cannot run concurrently on the same NetWare server.

Syntax

```
LOAD PSERVER .CN=printservername  
.OU=container.O=container
```

Additional Information

Topic	Refer to
Using PSERVER	Appendix A, "Setting Up and Servicing Print Servers" in <i>Print Services</i> .

PUPGRADE

Purpose

Use at the sever console to

- ◆ Upgrade your NetWare 3 print servers and printers to NetWare 4 Directory Service objects
- ◆ Upgrade your NetWare 3 PRINTCON and PRINTDEF databases to NetWare 4 format

Important 

Unless you run PUPGRADE, your NetWare 3 bindery print objects will not be upgraded.

Syntax

LOAD PUPGRADE

Additional Information

Topic	Refer to
Using PUPGRADE	"Using PUPGRADE.NLM" in Chapter 10 of <i>Print Services</i> .

PURGE

Purpose

Use at the workstation to permanently remove previously deleted files from the file system.

Syntax

```
PURGE [filename | path] [/option...] [/? | /VER]
```

Parameters

Parameter	Use to
<i>filename</i>	Replace <i>filename</i> with the names of the files you want to purge. Wildcards are allowed.
<i>path</i>	Replace <i>path</i> with the complete path of the directory containing the files you want to purge.
<i>/option</i>	Replace <i>option</i> with any available option. See “PURGE Options” on page 234.
<i>/?</i>	View online help. All other parameters are ignored when <i>/?</i> is used.
/VER	View the version number of the utility and the list of files it uses to execute. All other parameters are ignored when /VER is used.

Using PURGE

- ◆ You must have the Delete right to the specified directory.



If you have the Delete right in the directory, and you don't specify deleted files to be removed, all deleted files are removed, even if you don't own them.

- ◆ If you have the Delete right at the root, you can use PURGE to remove all deleted files in the entire volume.

PURGE Options

Option	Use to
/A	Purge all files in the current directory and its subdirectories.



If you don't use /A, PURGE removes only the files in the specified directory.

Examples

- ◆ To purge all files in the current directory, type

PURGE *.*

- ◆ To purge all .RPT files in the current directory and the subdirectories, type

PURGE *.RPT /A

- ◆ To purge all files starting at the root of the volume (you must have delete rights to the entire volume), type

PURGE *.* /A

Additional Information

Topic	See
Using FILER	“FILER” (page 70).
Using RIGHTS	“RIGHTS” (page 261).
Salvaging deleted files	“Salvaging and Purging Deleted Files and Directories” in Chapter 2 of <i>Supervising the Network</i> .

RCONSOLE

Purpose

Use at a workstation to access the server by creating a remote server console.



RCONSOLE will not allow remote access to a server if the network supervisor has not enabled remote connections using REMOTE.

During a remote console session, you can load and unload modules, execute console commands, and copy files to NetWare directories or to non-NetWare partitions. You cannot transfer files from a server.

Syntax

RCONSOLE [*server name*] | [*server name**]

Parameter	Use to
(no parameter)	Start a remote session either through a direct connection (SPX) or through an asynchronous connection (a modem). The system displays a menu from which you choose the connection type.
<i>server name</i>	Specify the name of the server or the IPX address you want to reach through a direct connection.
	Note: You can only specify the server name if you are establishing an SPX connection. You can't use this parameter when establishing an asynchronous connection.

Parameter	Use to
<code>server_name*</code>	Specify the partial name of the server you want to connect to via SPX. RCONSOLE then lists servers that begin with the specified sequence of letters.
	For example, to list servers that begin with SLS, type
	RCONSOLE SLS*

Using RCONSOLE

- ◆ You can access a remote server on the same network (a direct connection) or through a modem or null modem cable (an asynchronous connection). Instructions for establishing each kind of connection are found in “Using Remote Console to Manage a Server” in Chapter 7 of *Supervising the Network*.
- ◆ To access a server remotely, the necessary remote modules must be loaded on the server, the RCONSOLE.EXE file must be loaded on the workstation, and you must know the remote password.

The remote modules that must be loaded on the server depend upon the way you are accessing the server: through a direct or an asynchronous connection. For more information, refer to “Using Remote Console to Manage a Server” in Chapter 7 of *Supervising the Network*.

In NetWare 4.1, the supervisor password doesn’t allow remote access unless you set it as the password when you load REMOTE.

- ◆ You can execute RCONSOLE from your local hard drive or from a network drive.
- ◆ You don’t need Supervisor object rights to the remote server, since RCONSOLE doesn’t use NetWare Directory Services.

- ◆ During a remote console session, you can press **<Alt>+<F1>** to display the RCONSOLE “Available Options” menu. This menu allows you to do the following:
 - ◆ Cycle through the screens being managed by the server
 - ◆ View lists of files and directories on the server
 - ◆ Transfer files to a server
 - ◆ Display the operating system prompt
 - ◆ Exit RCONSOLE
 - ◆ Display the address of the workstation
 - ◆ Buffer keystrokes sent to the server
- While the menu is displayed, press **<F1>** to display a help screen.
- ◆ You can use the following keystrokes during a remote console session. All other keys function as if you were at the server console.

To	Press
Access the RCONSOLE “Available Options” menu	<Alt>+<F1>
Exit RCONSOLE	<Alt>+<F2>
Cycle through the console screens	<Alt>+<F3> or <Alt>+<F4>
Show the address of the workstation you are using	<Alt>+<F5>

Additional Information

Topic	See
Using RCONSOLE	“Using Remote Console to Manage a Server” in Chapter 7 of <i>Supervising the Network</i> .
Using REMOTE	“REMOTE” (page 248).

REGISTER MEMORY

Purpose

Use at the server console to configure the operating system to recognize installed memory above the amount of memory that is automatically registered.



NetWare 4.1 can address up to 3.25 gigabytes. This limitation is due to the size of the cache block tables used for memory management.

Syntax

REGISTER MEMORY *start_address amount*

Parameter	Use to
<i>start_address</i>	Specify the hexadecimal address where the memory you're adding will start. This is the amount of RAM your server currently recognizes and addresses.
	This number is usually 16 MB (1000000h); however, the default varies depending on the machine type.
	To obtain the start address, use the MEMORY command and convert its output to hexadecimal.
<i>amount</i>	Specify an amount of memory, expressed in hexadecimal, that is installed beyond the start address. This number must be divisible by 10h.



In the preceding table and in the following sections, the "h" after the number denotes a hexadecimal number. The "d" denotes a decimal number.

For example, 1000000h is 1 million in hexadecimal, and 1000000d is 1 million in decimal.

The hexadecimal numbers A through F correspond to the decimal numbers 10 through 15, respectively.

Using REGISTER MEMORY

- ◆ NetWare registers all memory that it recognizes according to bus type. On an ISA bus, NetWare recognizes up to 16 MB. On an EISA or MCA bus, NetWare recognizes all of the memory that is present. On a computer with a Peripheral Component Interconnect (PCI) bus, NetWare 4.1 recognizes up to 64 MB.
- ◆ To have the additional memory registered automatically when the server boots, add the REGISTER MEMORY line to the STARTUP.NCF file.

Add this line just after the commands for the server name and internal network number, and before the volumes are mounted.

Important 

Place the REGISTER MEMORY command before the MOUNT ALL command in the STARUTP.NCF file so that the registered memory will be available to all volumes.

Failure to register memory before the SYS: volume is mounted can result in error messages indicating that the cache memory allocator is out of available memory, or that there is insufficient memory to mount volumes.

- ◆ If the memory does not register, check for the following possible errors:
 - ◆ An incorrect hexadecimal value was specified for *start address* or *amount*.
 - ◆ The *amount* value exceeds the total installed memory. Use the setup or reference diskette that came with the computer to determine the total amount of installed memory.

Note 

If you have more than 16 MB of server memory installed, you must avoid memory address conflicts. A conflict occurs if an adapter board uses 16- or 24-bit DMA or Bus-Master DMA.

To resolve this conflict, upgrade to 32-bit bus adapters or use drivers that are modified and certified to compensate for memory-addressing limitations. Or use the machine's configuration program to "move" system memory around the adapter if the program allows.

- ◆ In some cases, the ISA (16-bit) host adapter driver must be loaded in memory below 16 MB. To do so, add the following to the STARTUP.NCF file:

```
SET AUTO REGISTER MEMORY ABOVE 16 MEGABYTES=OFF
LOAD disk_driver
REGISTER MEMORY amount of memory to add
```

For more information, consult the driver documentation.

Determining the Amount of Memory

The following table lists common start address and amount values for standard computers.

In the table, total memory = start address + amount of memory to add.

Total Memory	Start Address	Amount of Memory to Add
20 MB	16 MB = 1000000h	4 MB = 400000h
24 MB	16 MB = 1000000h	8 MB = 800000h
28 MB	16 MB = 1000000h	12 MB = C00000h
32 MB	16 MB = 1000000h	16 MB = 1000000h
36 MB	16 MB = 1000000h	20 MB = 1400000h
40 MB	16 MB = 1000000h	24 MB = 1800000h
64 MB	16 MB = 1000000h	48 MB = 3000000h
112 MB	16 MB = 1000000h	96 MB = 6000000h
128 MB	16 MB = 1000000h	112 MB = 7000000h
256 MB	16 MB = 1000000h	240 MB = F000000h
400 MB	16 MB = 1000000h	384 MB = 18000000h

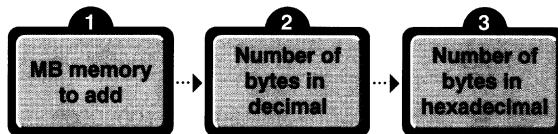
REGISTER MEMORY

Total Memory	Start Address	Amount of Memory to Add
1 GB (1000 MB)	16 MB = 1000000h	984 MB = 3D80000h
3 GB (3000 MB)	16 MB = 1000000h	2984 MB = BA800000h
3 GB (3000 MB)	64 MB = 4000000h	2936 MB = B7800000h

REGISTER MEMORY requires that the amount of memory to be registered is stated in hexadecimal format. If you are adding an amount of memory that is not in the preceding table, then you need to calculate the amount.

Calculating the Amount of Memory

The following figures illustrates how to calculate the amount of memory you are adding:



1. Start with the amount of memory you are adding stated in decimal MB.

Obtain this number from the documentation that came with the memory you are adding.

2. Convert the memory value from MB to bytes.



A megabyte of memory is more than a million bytes. One megabyte equals 1,048,576 bytes in decimal.

3. Convert the number of bytes from decimal to hexadecimal notation.

To do this calculation, you can either use a calculator that converts decimal numbers to hexadecimal, or you can convert manually.

For example, 1 megabyte = 1,048,576d, which is the same as 100000h.

So 1,048,576 bytes in decimal equals 100000 in hexadecimal.

To convert manually, consult a specialized manual.

Examples

- ◆ To add 4 MB of memory above 16 MB, type

REGISTER MEMORY 1000000 400000

- ◆ To add 24 MB of memory above 16 MB, type

REGISTER MEMORY 1000000 1800000

Additional Information

Topic	See
Editing the AUTOEXEC.NCF file	"Modify the AUTOEXEC.NCF File" in Chapter 3 of <i>Installation</i> .
Displaying the total amount of memory the server is addressing	"Creating or Editing a Server Batch (.NCF) File" in Chapter 7 of <i>Supervising the Network</i> . "MEMORY" (page 135).

REINITIALIZE SYSTEM

Purpose

Use at the server console to enable configuration changes made since the commands in the NETINFO.CFG file were executed.

Syntax

REINITIALIZE SYSTEM

Using REINITIALIZE SYSTEM

- ◆ REINITIALIZE SYSTEM compares the current NETINFO.CFG file with the previous one, which became effective the last time you ran the INITIALIZE SYSTEM or REINITIALIZE SYSTEM command. If REINITIALIZE SYSTEM finds any new commands in the current NETINFO.CFG file, it executes them.
- ◆ REINITIALIZE SYSTEM also informs any Simple Network Management Protocol (SNMP)-registered NLM file that it is executing. This is a “call-back” mechanism that enables NLM files that store configuration information outside the NETINFO.CFG file to know that changes to the configuration have taken place.

Limitations of REINITIALIZE SYSTEM

- ◆ REINITIALIZE SYSTEM unloads any NLM affected by a configuration change. If REINITIALIZE SYSTEM cannot unload the NLM because of interdependencies with other modules, the configuration change will not take effect. Additionally, not all NLM files register with SNMP for notification of REINITIALIZE SYSTEM.
- ◆ When you create a new configuration or delete an existing configuration, REINITIALIZE SYSTEM recognizes the change. However, REINITIALIZE SYSTEM may not recognize changes to an already configured NLM that involve more than loading, unloading, binding, or unbinding protocol stacks.

Important 

If you are changing an existing configuration, the most effective way to ensure the changes are recognized is to down the server. Alternatively, if you know which NLM files have been changed by your modifications, you can unload them, then execute REINITIALIZE SYSTEM.

Additional Information

Topic	See
NETINFO.CFG file	"INETCFG" (page 95).
INITIALIZE SYSTEM	"INITIALIZE SYSTEM" (page 99).

REMAPID

Purpose

Assists NETSYNC3 in handling password changes.

REMAPID is autoloaded by NETSYNC3 on every NetWare 3.1x server in the NetSync cluster.

REMAPID also handles password IDs that are changed by NetSync. It must remain loaded even after NETSYNC3 is unloaded so that users can continue to log in to the NetWare 3.1x server.

The NetSync installation program adds the command to load REMAPID to the AUTOEXEC.NCF file on the 3.1x server.

Syntax

Autoloaded by NETSYNC3.NLM.

Additional Information

Topic	See
Installing REMAPID	<i>Installing and Using NetSync.</i>

REMIRROR PARTITION

Purpose

Use at the server console to start the remirroring of a logical partition.

Because the server remirrors partitions automatically, you should use REMIRROR PARTITION only if you have stopped remirroring or something has caused your server to cease remirroring.

Syntax

REMIRROR PARTITION *number*

Parameter	Use to
<i>number</i>	Specify the number of the logical partition you want to start remirroring.

Example

To start remirroring for logical partition 4, type

REMIRROR PARTITION 4

Additional Information

Topic	See
Stopping remirroring	“ABORT REMIRROR” (page 3).
Mirroring and unmirroring hard disks	“Mirroring and Duplexing a Hard Disk” and “Unmirroring Hard Disks” in Chapter 7 of <i>Supervising the Network</i> .

REMOTE

Purpose

Load at the server console to allow remote access to the server from a workstation.

Syntax

LOAD [path] REMOTE password | -E Epassword

Parameter	Use to
<i>path</i>	Specify the path to REMOTE.NLM if you moved it from the default directory.
<i>password</i>	Specify the password you want administrators of the remote server to use. REMOTE requires either a password or an encrypted password.
	When you execute RCONSOLE, you use the password you established when you loaded REMOTE.
Note: In NetWare 4.1, the supervisor password doesn't allow remote access unless it is set as the password when you load REMOTE.	
-E	If you specify this parameter, the password that follows must be an encrypted password.
	Note: You can't use this parameter until you have first loaded REMOTE using the unencrypted password and then determined the encrypted value of the password by executing the REMOTE ENCRYPT command. Refer to the next section for more information about encrypting passwords.
<i>Epassword</i>	Specify the encrypted value of the password you want administrators of the remote server to use.
	To obtain the encrypted value of a password, use REMOTE ENCRYPT as described in the next section.

Using REMOTE

- ◆ Before RCONSOLE can be used to access a server from a workstation, you must load REMOTE on the server. When you load REMOTE, you establish a password that must also be entered when you execute RCONSOLE on the workstation.

To optimize security, use an encrypted password when loading REMOTE.

To encrypt the password, follow these steps:

Procedure 

1. **Load REMOTE with the unencrypted password.**
2. **Type**

REMOTE ENCRYPT

The system prompts you for a password to encrypt.

3. **Type the password and press <Enter>.**

The system displays the encrypted value and a message asking if the LOAD REMOTE command should be written to the SYS:SYSTEM\LDREMOTE.NCF file.

4. **Respond “Yes.”**

The system places a LOAD REMOTE command into the LDREMOTE.NCF file with the encrypted password as a parameter. You can execute this file to load the REMOTE module with the encrypted password.

5. To execute the file, type LDREMOTE at the console prompt.

- ◆ After you load REMOTE, you must load other modules to make remote console sessions available.

- ◆ For direct connections, load the following:

RSPX

- ◆ For asynchronous connections, load the following in the order shown:

AIOCOMX (or other communication port driver)

AIO

RS232

If you load AIOCOMX, you do not need to load AIO, because it is autoloaded by AIOCOMX. However, if you load another communication port driver, you may have to load AIO manually.

- ◆ To make RCONSOLE sessions available whenever you boot the server, enter the following commands in the AUTOEXEC.NCF file in the order shown.

- ◆ For direct connections:

LDREMOTE

LOAD RSPX

- ◆ For asynchronous connections:

LDREMOTE

LOAD AIOCOMX (or other communication port driver)

LOAD AIO

LOAD RS232 *com_port baud_rate [N] [C]*

Include the N parameter if you are using a null modem cable. Include the C parameter if you are using a callback list. For more information about these parameters, see “Running a Remote Console Session Over a Modem” in Chapter 7 of *Supervising the Network*.

If you load AIOCOMX, you do not need to include the command to load AIO. However, if you load another communication port driver, you may have to include the LOAD AIO command.

- ◆ Once you load REMOTE, you can use the REMOTE command to enable or disable remote connections. The syntax is

REMOTE [parameter]

Parameter	Use to
LOCK OUT	Prevent new remote connections. This parameter prevents new remote console sessions from being established with the server.
UNLOCK	Allow new remote connections. This parameter is used to reenable remote sessions after the LOCK OUT parameter disabled them.
HELP	View online help.

Examples

- ◆ To load REMOTE with password SECRET, type

LOAD REMOTE SECRET

- ◆ To obtain the encrypted value of a password, type

REMOTE ENCRYPT

- ◆ To load REMOTE with an encrypted password, previously obtained by executing REMOTE ENCRYPT, type

LOAD REMOTE -E 870B7E366363

- ◆ To disable new remote connections to the server, type

REMOTE LOCK OUT

- ◆ To enable new connections to the server, type

REMOTE UNLOCK

- ◆ To view help information for the REMOTE command, type

REMOTE HELP

Additional Information

Topic	See
Loading RSPX	“RSPX” (page 276).
Loading RS232	“RS232” (page 274).
Setting up a remote console	“Using Remote Console to Manage a Server” in Chapter 7 of <i>Supervising the Network</i> .
Using RCONSOLE	“RCONSOLE” (page 236).
Editing the AUTOEXEC.NCF file	“Modify the AUTOEXEC.NCF File” in Chapter 3 of <i>Installation</i> .
	“Creating or Editing a Server Batch (.NCF) File” in Chapter 7 of <i>Supervising the Network</i> .

REMOVE DOS

Purpose

Use at the server console to

- ◆ Remove DOS from the server's memory
- ◆ Cause the server to be cold booted with the EXIT command



A cold boot powers down the machine, clears memory and internal settings, and boots the machine.

Syntax

REMOVE DOS

Using REMOVE DOS

- ◆ If available memory in the server is low, use this command to free additional memory for file caching.
- ◆ When you execute REMOVE DOS, the memory used for DOS is returned to the system for file caching.
- ◆ Removing DOS increases network security because loadable modules can't be loaded from the server's DOS drives.
- ◆ Once this command is issued, DOS is no longer resident in the server and NLM programs on DOS drives aren't accessible. If you need to load these modules, copy them to a network drive before executing REMOVE DOS.
- ◆ If you remove DOS from the server, then when you use the EXIT command to exit the server console, you are not returned to DOS as you normally would be. Instead, the server reboots. This functionality of the REMOVE DOS command allows those using RCONSOLE to reboot the server remotely.

Additional Information

Topic	See
Remote booting a server	"Rebooting a Remote Server" in Chapter 7 of <i>Supervising the Network</i> .

RENDIR

Purpose

Use at a workstation to rename a directory.

Syntax

RENDIR *path* [**TO**] *directory name* [**/?** | **/VER**]

Parameter	Use to
<i>path</i>	Specify the path leading to and including the directory you want to rename.
<i>directory name</i>	Specify the new name of the directory.
/?	View online help. All other parameters are ignored when /? is used.
/VER	View the version number of the utility and the list of files it uses to execute. All other parameters are ignored when /VER is used.

Using RENDIR

- ◆ If you rename a directory, change any drive mappings that include the directory to reflect the new name.
- ◆ You can use a period to represent your default directory.
- ◆ You can use **:****/** to represent your current drive and volume.

Examples

- ◆ To rename DOSAPPS (your current directory) to WINAPPS, type

RENDIR DOSAPPS WINAPPS

- ◆ To rename directory USE on drive Z: to USERS, type

RENDIR Z:USE USERS

- ◆ To rename your current directory to PROGRAMS, type

RENDIR . PROGRAMS

- ◆ To rename the directory where drive G: is mapped to PROGRAMS, type

RENDIR G: PROGRAMS

- ◆ To rename directory TOOL to TOOLKIT on your current drive and volume, type

RENDIR :/TOOL TOOLKIT

Additional Information

Topic	See
Directory structure	“Directory structure” in <i>Concepts</i> .
Drive mappings	“Drive mapping” in <i>Concepts</i> .
	“MAP” in Chapter 3 of <i>Supervising the Network</i> .

RESET ROUTER

Purpose

Use at the server console to reset the router table in the server if the table becomes inaccurate or corrupted.

Syntax

RESET ROUTER

Using RESET ROUTER

- ◆ If several servers or bridges go down, packets sent to or through their routers are lost. Use RESET ROUTER to update router tables on active servers.
- ◆ Normally, the router updates its tables every minute. This command updates the router table immediately.

RESTART

Purpose

Use at the server console to reload the IOEngine on one NetWare 4.1 SFT III server while leaving the other server running, or to force a server to switch over from primary to secondary.

Syntax

RESTART

Using RESTART

- ◆ RESTART is valid only when servers are mirrored.
- ◆ Execute RESTART from the appropriate IOEngine. If you execute RESTART from an MSEngine, you receive an "unknown command" message.
- ◆ When the primary IOEngine is reloaded using RESTART, the secondary server takes over as the primary server. When the secondary IOEngine is restarted, the primary server remains running.



Disks should be mirrored before you restart the primary IOEngine. If disks aren't mirrored when you execute RESTART, the following message appears:

WARNING!!! Not every disk is remirrored. Answering yes may cause some volumes to dismount and open files to be lost.

Are you sure you wish to halt then restart the primary server?

RESTART SERVER

Purpose

Use at the server console to restart the server after downing it.

Syntax

RESTART SERVER [*–parameter*]

Parameter	Use to
(no parameter)	Restart the server and invoke all .NCF files.
<i>–ns</i>	Restart the server without invoking the STARTUP.NCF file.
	For example, type: RESTART SERVER –ns
<i>–na</i>	Restart the server without invoking the AUTOEXEC.NCF file.

Using RESTART SERVER

RESTART SERVER is useful when troubleshooting requires that you frequently down the server.

Additional Information

Topic	See
Restarting the server from DOS	“SERVER” on page 293.

RIGHTS

Purpose

Use at a workstation to

- ◆ View or modify user or group rights for files
- ◆ View or modify user or group rights for directories and volumes

Syntax

```
RIGHTS path [[ + | - ] rights] [/option...]
[/? | /VER]
```

Parameter	Use to
<i>path</i>	Specify the path to the file, directory, or volume you want to modify or view rights to (you must always specify a path).
+ -	Add or delete the specified rights. See “Using RIGHTS” (page 263).
<i>rights</i>	Specify one or more file or directory rights. See “File and Directory Rights” on page 262.
/option	Replace <i>option</i> with any available option. See “RIGHTS Options” on page 262.
/?	View online help. All other parameters are ignored when /? is used.
/VER	View the version number of the utility and the list of files it uses to execute. All other parameters are ignored when /VER is used.

RIGHTS Options

Option	Use to
/C	Scroll continuously through output.
/F	View the Inherited Rights Filter (IRF).
/I	View the trustee and group rights that created the inherited rights, and view where the inherited rights came from.
/NAME= <i>username</i>	View or modify rights for the user or group listed. Replace <i>username</i> with the name of the user or group whose rights you want to view or modify.
/S	View or modify subdirectories below the current level.
/T	View trustee assignments in a directory.

File and Directory Rights

The following table lists the rights, the letter to use for each right, and what the right is used for.

Right	Use to
S (Supervisor)	Grant all rights to the file or directory.
R (Read)	Open and read files in the directory.
W (Write)	Open and write to files in the directory.
C (Create)	Create files and subdirectories.
E (Erase)	Erase files and directories.
M (Modify)	Rename files and directories, and change file attributes.

Right	Use to
F (File Scan)	View and search on file and directory names in the file system structure.
A (Access Control)	Add and remove trustees and change trustee rights to files and directories.
N (No Rights)	Remove all rights.
REM (Remove)	Remove the user or group as a trustee of the specified file or directory.
ALL	Add All rights except Supervisor.

Using RIGHTS

- ◆ If you use + (plus) to add rights, the rights you list are added to the existing rights.
- ◆ If you use - (minus) to remove rights, the rights you list are deleted from the existing rights.
- ◆ If you add and delete rights in the same command, group all added rights together and all deleted rights together.
- ◆ If you list rights without using + or -, the rights you list replace the existing rights.
- ◆ You must always specify a path. You can use a period (.) to represent your current directory.
- ◆ You can use wildcard characters.

Examples

- ◆ To set the trustee rights in the current directory for user JANICE to Read, Write, and File Scan, type

RIGHTS . R W F /NAME=JANICE

- ◆ To remove user JACIE from ALICE/SYS:USERS, type

RIGHTS ALICE/SYS:USERS REM /NAME=JACIE

- ◆ To see where user PAT's inherited rights came from for SYS:USERS/HOME, type

RIGHTS SYS:USERS/HOME /NAME=PAT /I

Additional Information

Topic	See
Trustee assignments	"Trustee" in <i>Concepts</i> .
Inherited rights	"Security" in <i>Concepts</i> .

ROUTE

Purpose

Use at the server console on a token ring cabling system to pass frames (packets) from NetWare through IBM-compatible source route bridges.

ROUTE enables the operating system to

- ◆ Keep track of the source routing information in the frames
- ◆ Configure the source routing information in the frames according to the parameters with which ROUTE is loaded



You must load the token ring LAN driver before you load ROUTE.

ROUTE and most ROUTE parameters can also be configured using the INETCFG utility. See the section below, "Configuring Source Route End Station Parameters with INETCFG."

Syntax

```
LOAD [path]ROUTE [BOARD=number] [NAME=board_name]
      [DEF|GBR|MBR] [TIME=number] [RSP=AR|NR] [CLEAR] |
      [REMOVE=number] [XTX=number] [UNLOAD]
      [BOARD=number]]
```

Parameter	Use to
<i>path</i>	Specify the path to ROUTE.NLM if you moved it from the default directory.
BOARD= <i>number</i>	Specify the board you want to change parameters on or load ROUTE for. Replace <i>number</i> with the board number. If you don't specify a board number, the default is board number 1, or the board name specified in the NAME parameter.
	The system numbers the boards, using 1 for the first driver loaded. (Check the order in the AUTOEXEC.NCF file.)
NAME= <i>board_name</i>	Specify the board name.
DEF (Default)	Specify that all Unknown Unicast frames are to be sent as All Routes Broadcast frames. If DEF is specified, all frames with addresses not in the server's Source Routing table are forwarded as All Routes Broadcast frames. If DEF is not specified, all frames with addresses not in the server's Source Routing table are forwarded as Single Route Broadcast frames.
	If ROUTE is already loaded with the DEF parameter, reloading ROUTE with DEF sends all Unknown Unicast frames as All Routes Broadcast frames.
GBR (General Broadcast frames)	Specify that all General Broadcast frames are to be sent as All Routes Broadcast frames. If this parameter is not specified when ROUTE is loaded, all General Broadcast frames are broadcast as Single Route Broadcast frames.
	If ROUTE is already loaded with the GBR parameter, reloading ROUTE with GBR broadcasts all General Broadcast frames as All Routes Broadcast frames.

Parameter	Use to
MBR (Multicast Broadcast frames)	<p>Specify that all Multicast frames are to be sent as All Routes Broadcast frames.</p> <p>If the parameter is not specified when ROUTE is loaded, all Multicast frames are broadcast as Single Route Broadcast frames.</p> <p>If ROUTE is already loaded with the MBR parameter, reloading ROUTE with MBR broadcasts all Multicast frames as All Routes Broadcast frames.</p>
TIME= <i>number</i>	<p>Specify how often the Source Routing table should be updated.</p> <p>Replace <i>number</i> with a value from 3 to 255 seconds. The default is 10 seconds.</p> <p>This parameter forces the table to be updated with a new route if the route isn't used during the specified time.</p> <p>It enables ROUTE to determine alternate routes dynamically when an IBM bridge goes down.</p>
RSP= <i>value</i> (Respond)	<p>Specify how the server should respond to a broadcast request.</p> <p>Replace <i>value</i> with one of the following:</p> <p>NR: Specifies that all Broadcast Requests are to be responded to directly; a Broadcast Response isn't required.</p> <p>AR (the default): Specifies that all Broadcast Requests are to be responded to with an All Routes Broadcast frame.</p>

ROUTE

Parameter	Use to
CLEAR	<p>Clear the Source Routing table. Use when an IBM bridge has gone down and an alternate route is available.</p> <p>CLEAR forces a dynamic rebuilding of the table by sending a default frame to each specific node in the network.</p> <p>Use CLEAR to completely clear the Source Routing table, or use REMOVE to clear only one node address from the Source Routing table.</p>
REMOVE= <i>number</i>	<p>Remove a specified node address from the server's Source Routing table.</p> <p>Replace <i>number</i> with a 12-digit (6-byte) hexadecimal number.</p> <p>If you enter fewer than nine digits, ROUTE prefixes the address with 4000 in hexadecimal.</p> <p>For example, REMOVE=2 becomes REMOVE=400000000002.</p> <p>Use REMOVE when a bridge has gone down. When you remove the node from the Source Routing table, you force the server to determine an alternate route.</p>
XTX= <i>number</i>	<p>Specify the number of times to transmit on a timed-out route, using the old route.</p> <p>Replace <i>number</i> with a value between 00 and 255 seconds. The default is 02 times.</p>

Parameter	Use to
UNLOAD [BOARD= <i>number</i>]	Use to remove source routing support for a specified board. If you don't specify a board number, the default is 1.

Example:

```
LOAD ROUTE UNLOAD BOARD=2
```

Note: This parameter does not unload ROUTE.NLM, but disables source routing only for the board that you specify.

Using ROUTE

- ◆ No parameters are required. However, you can load ROUTE a second time with a specified parameter to change the configuration.
- ◆ Most of the parameters have default values that should work with simple configurations for IBM bridges.

If you have parallel IBM bridges, you can change some of the parameters to reduce traffic on some of the paths.

- ◆ As frames pass through an IBM bridge, source routing information is added to the frame header at the Media Access Control (MAC) layer. The operating system's bridging is done above this layer.
- ◆ ROUTE can be loaded re-entrantly.
 - ◆ If you have two token ring boards in the server, load ROUTE twice. The second time you load it, use the BOARD or NAME parameter to specify a particular board.
 - ◆ To change the configuration, load ROUTE with the parameter that needs to be changed.

Configuring Source Route End Station Parameters with INETCFG

You can use INETCFG to load ROUTE and configure many source route end station parameters.

To use INETCFG, follow these steps.

Procedure 

- 1. Load INETCFG.**
- 2. From the “Internetwork Configuration” menu, choose the “Boards” option to load a token ring board.**
- 3. Return to the “Internetwork Configuration” menu and use the “Protocols” option to enable “Source Route End Station.”**
- 4. Return to the “Internetwork Configuration” menu and select “Bindings.”**

A list of bindings appears.

- 5. Select an existing binding or press <Insert> to add a new binding.**

A list of enabled protocols appears.

- 6. Select “Source Route End Station.”**

A list of boards is displayed.

- 7. Select the token ring board you configured with the “Boards” option.**

The “Attach Source Route End Station to an Interface” menu appears.

The following Source Route End Station parameters are available:

Parameter	Use to
Interface Name (same as <i>NAME=board_name</i> command line parameter)	View the name of the interface to which the end station source router is bound. This field is read-only.
Frame Type	<p>View or modify the source route end station list of frame types.</p> <p>Press <Enter> to see the list. Press <Insert> to select a frame type. Press <Delete> to remove a frame type.</p>
Send Frames with Unknown Address (same as DEF [Default] command line parameter)	<p>Specify the type of explorer frame the end station source router sends to an unknown node address.</p> <p>Options: Single Route Explorer Frame, All Routes Explorer Frame</p> <p>Default: Single Route Explorer Frame</p>
Send Broadcast Frames (same as GBR command line parameter)	<p>Specify the type of explorer frame the end station source router sends to a broadcast destination address.</p> <p>Options: Single Route Explorer Frame, All Routes Explorer Frame</p> <p>Default: Single Route Explorer Frame</p>
Send Multicast Frames (same as MBR command line parameter)	<p>Specify the type of explorer frame the end station source router sends to a multicast, group, or functional address.</p> <p>Options: Single Route Explorer Frame, All Routes Explorer Frame</p> <p>Default: Single Route Explorer Frame</p>
Respond to Broadcast Request (same as RSP command line parameter)	<p>Specify how the end station source router responds to a single route explorer frame.</p> <p>Options: Specifically Routed Frame, All Routes Explorer Frame</p> <p>Default: All Routes Explorer Frame</p>
Route Update Interval (same as TIME= <i>number</i> command line parameter)	<p>Specify the minimum delay in seconds before the end station source router updates the route for a given node.</p> <p>Range: 0 to 65,535 seconds (0=infinite)</p> <p>Default: 10</p>



Note To remove source route bridge support for the specified board, disable the binding.

Additional Information

Topic	See
INETCFG	"INETCFG" (page 95)
Source routing	"Source routing" in <i>Concepts</i> .
Source routing and broadcast frames	<i>IBM Token-Ring Network Architecture Reference</i> .

RPL

Purpose

Use at the server console to enable the remote booting of diskless workstations that have network boards installed.

Syntax

LOAD [path]RPL

Parameter	Use to
<i>path</i>	Specify the path to RPL.NLM if you moved it from the default directory.

Using RPL

- ◆ The RPL.NLM program is used in networks that have diskless workstations installed with the RPL BIOS module. RPL.NLM provides the Remote Program Load protocol stack to the server.
- ◆ After loading the RPL protocol stack, you must bind RPL to the network board in the server.

Additional Information

Topic	See
Using RPL to set up Remote DOS workstations	Chapter 6, "Setting Up Remote Client Workstations" in <i>NetWare Client for DOS and MS Windows User Guide</i> .
Using RPL to set up Remote OS/2 workstations	Chapter 11, "Using Remote Program Load" in <i>NetWare Client for OS/2 User Guide</i> .

RS232

Purpose

Use at the server console to set up a communication port for remote management over a modem or null modem cable.

The RS232 module is an asynchronous communications driver that initiates the server's communication port and transfers screen and keystroke information to and from REMOTE.

Syntax

LOAD [path]RS232 [COM port] [modem speed] [N][C]

Parameter	Use to
<i>path</i>	Specify the path to RS232.NLM if you moved it from the default directory.
<i>COM port</i>	Specify the communication port (1 or 2). If you don't specify a COM port with the LOAD command, you are prompted for it.
<i>modem speed</i>	Specify the baud rate of your modem (2400, 4800, or 9600). If you don't enter the modem speed with the LOAD command, you are prompted for it.
N	Specify that a null modem cable will be used.
C	Enable callback functions.

Using RS232



You must load a communication port driver (such as AIOCOMX) and AIO before you load RS232. (If you load AIOCOMX first, it autoloads AIO. If you use a third-party communication port driver, you may need to load AIO manually.)

After RS232 is loaded, you can execute the following commands while in the utility:

Command	Use to
RS232	View RS232 driver settings.
MODEM	Interact with the modem.
MODEM <i>filename</i>	Retrieve modem commands from a file.
MODEM <i>modem_command</i>	Send commands directly to the modem.

Additional Information

Topic	See
Using RS232	"Using Remote Console to Manage a Server" in Chapter 7 of <i>Supervising the Network</i> .

RSPX

Purpose

Use at the server console to allow RCONSOLE to access a server over a direct connection. RSPX loads the SPX driver for REMOTE and advertises the server to workstations.

RSPX provides an optional security feature requiring that all RSPX packets contain signatures.

Note 

RSPX packet signatures are not related to NCP packet signatures. To modify RSPX packet signature requirements, use RSPX. To modify NCP packet signature requirements, use SERVMAN or SET. See "SERVMAN" on page 295 or "SET" on page 299.

Syntax

LOAD [path] RSPX [SIGNATURES OFF]

Parameter	Use to
<i>path</i>	Specify the path to RSPX.NLM if you moved it from the default directory.
SIGNATURES OFF	Allow remote console RSPX packets without signatures.
	The default is packet signatures ON.

Note: If you use a NetWare 3.11 version of RCONSOLE to access a NetWare 4 server, turn packet signatures off when you load RSPX.

Using RSPX

After RSPX is loaded, the following commands are valid:

RSPX [parameter]

Parameter	Use to
(no parameter)	View RSPX status information.
SIGNATURES ON	Require all RCONSOLE client RSPX packets to contain signatures.
SIGNATURES OFF	Allow RCONSOLE client packets without signatures.
	Note: If you use a NetWare 3.11 version of RCONSOLE to access a NetWare 4 server, turn packet signatures off when you load RSPX on the server.
HELP	View online help.

Additional Information

Topic	See
Using RSPX	"Using Remote Console to Manage a Server" in Chapter 7 of <i>Supervising the Network</i> .

SBACKUP

Purpose

Use at the server console to back up and restore specified data on a server, workstation, or service that you select.

Syntax

```
LOAD [path] SBACKUP SIZE=xx BUFFER=x
```

Parameter	Use to
<i>path</i>	Specify the path to SBACKUP.NLM if you moved it from the default directory.
SIZE=xx	Specify the size of the buffer (in KB). Supported values: 16, 32, 64, 128, or 256. Default: 64 KB.
BUFFER =x	Specify the number of buffers. Supported values: 2 to 10. Default: 4.

Additional Information

Topic	See
Using SBACKUP	Chapter 9, "Backing Up and Restoring Data," in <i>Supervising the Network</i> .

SCAN FOR NEW DEVICES

Purpose

Use at the server console to register new devices with the media manager so they are available to the operating system.

Syntax

SCAN FOR NEW DEVICES

Using SCAN FOR NEW DEVICES

- ◆ Use this utility if you add new devices after you boot your server and the devices do not then appear with the LIST DEVICES command.
- ◆ If devices have been added, but the drivers aren't loaded in STARTUP.NCF, use SCAN FOR NEW DEVICES after loading the drivers to register the devices with the system.
- ◆ If NetWare detects new devices since you booted the server, SCAN FOR NEW DEVICES registers the devices with the operating system. It does not return a message to the screen.
- ◆ SCAN FOR NEW DEVICES does not produce any output.
- ◆ If you remove a hot-plug mirrored disk without bringing down the server, you must execute SCAN FOR NEW DEVICES as soon as you remove the disk. This lets the system know that the remaining disk in the mirrored pair is no longer synchronized with a mirrored partner. If you unmirror the disk before removing it, you do not need to run SCAN FOR NEW DEVICES.

SCHDELAY

Purpose

Use at the server console to

- ◆ Prioritize server processes
- ◆ Schedule processes to use less of the server's CPU
- ◆ Slow processes when the server is very busy

Syntax

LOAD SCHDELAY [process_name = number...]

Parameter	Use to
(no parameter)	View a list of all valid process names and their current SCHDELAY values. If the list scrolls off the screen, you may choose to view the list in the "Scheduling Information" option in MONITOR.
<i>process_name</i>	Specify a process that will use the scheduling delay. Valid processes are those that access the server's CPU.
<i>number</i>	Specify the frequency at which the process should run. Valid values are 0 (run every cycle) and from 2 to 10000. For example, 2 means run every second cycle.

You can undo SCHDELAY values for all processes by replacing *process_name* with **ALL PROCESSES** and replacing *number* with **0**. This causes all processes to run with no delays. The command syntax is

LOAD SCHDELAY ALL PROCESSES = 0

Using SCHDELAY



Note The SCHDELAY value affects processes only when the system is busy.

- ◆ You can specify multiple process delays at one time.
- ◆ To slow specific processes and use less of the server's CPU each time the server boots, place a SCHDELAY command in your AUTOEXEC.NCF file.
- ◆ You can also view scheduling delays with the "Scheduling Information" option in MONITOR.

Example

To schedule the Remirror process to skip every other cycle, type

LOAD SCHDELAY REMIRROR PROCESS = 2

Additional Information

Topic	See
Determining which processes are hoarding CPU time or which SCHDELAY value to assign to a process	"Prioritizing Server Processes" in Chapter 7 of <i>Supervising the Network</i> .
Editing the AUTOEXEC.NCF file	"Modify the AUTOEXEC.NCF File" in Chapter 3 of <i>Installation</i> . "Creating or Editing a Server Batch (.NCF) File" in Chapter 7 of <i>Supervising the Network</i> .

SEARCH

Purpose

Use at the server console to

- ◆ Tell the server where to look for loadable module files and .NCF files
- ◆ Add other search paths or delete current search paths
- ◆ View the current search paths for the operating system

Syntax

SEARCH [ADD [*number*] *path*]

or

SEARCH DEL [*number*]

Parameter	Use to
(no parameter)	View the current search paths.
<i>number</i>	Specify the number of the search drive you want to add or remove.
<i>path</i>	Specify the complete path of the directory you want searched. (The default is SYS:SYSTEM.)
	Begin the path with a DOS drive letter or a NetWare volume name.

Using **SEARCH**

- ◆ To set search paths each time the server comes up, place the **SEARCH** commands in the **AUTOEXEC.NCF** file.
- ◆ If you execute **SECURE CONSOLE**, **SEARCH** is disabled. The **SYS:SYSTEM** search path remains in effect, but you cannot create new search paths.

Once you execute **SECURE CONSOLE**, you must bring down the server and reboot it to create additional search paths.

Note 

When the server comes up and the **SYS:** volume is mounted, the search path to the boot partition is deleted.

Example

- ◆ To display the current server search paths, type

SEARCH

- ◆ To add **VOL1:NCF** (a network directory) as a search path, type

SEARCH ADD VOL1:NCF

Additional Information

Topic	See
Adding a search path	"Viewing and Adding Server Search Paths" in Chapter 7 of <i>Supervising the Network</i> .

SECURE CONSOLE

Purpose

Use at the server console to increase network security by

- ◆ Preventing loadable modules from being loaded from any directory other than SYS:SYSTEM
- ◆ Preventing keyboard entry into the operating system debugger
- ◆ Preventing the server date and time from being changed
- ◆ Removing DOS from the server and sending it to disk cache

Syntax

SECURE CONSOLE

Using SECURE CONSOLE

- ◆ When you execute SECURE CONSOLE, path specifiers are disabled. The SYS:SYSTEM search path remains in effect, but you cannot create new search paths.
- ◆ Use of SECURE CONSOLE is recommended, especially in security-sensitive environments. SECURE CONSOLE prevents the following types of breaches in security:
 - ◆ **Trojan Horse modules.** If you don't use SECURE CONSOLE, a module can be loaded from a DOS partition, a diskette drive, or any directory on a NetWare volume.
If you allow modules to be loaded from all these drives, anyone who has access to the server console can load a loadable module. An intruder could create a module to access or alter any information on the server, or to change user account information at the server security level.

- ◆ **Date and Time Modifications.** Some security and accounting features (such as password expiration, time restrictions, intruder detection, and lockout intervals) depend on date and time for their enforcement.

If you don't use SECURE CONSOLE, an intruder can change the date and time at the server and bypass these time-dependent features.

- ◆ **DOS Access.** If DOS is installed on the server console, an intruder can bring down the server and execute a DOS file developed expressly to steal or alter data.

Because SECURE CONSOLE removes DOS, the intruder must turn the server off and then on again to access DOS.

If your server has a power-on password, the intruder cannot access DOS. (See the documentation that comes with the computer for information on setting a power-on password. Not all computers have this feature.)

- ◆ To disable SECURE CONSOLE, down the server properly, and then reboot the server.

Additional Information

Topic	See
Additional security tips	"Server console" in <i>Concepts</i> .
Removing DOS	"REMOVE DOS" (page 254).

SEND

Purpose

Use at a workstation or server console to

- ◆ Send messages to users attached to the server
- ◆ Set a workstation to receive all messages, only system messages, or no messages
- ◆ View the current broadcast mode at the client
- ◆ Poll for messages
- ◆ Send a message to all users logged in or attached to the NetWare server, or to a list of users or connection numbers



The console command SEND has the same functionality as the BROADCAST command from previous versions of NetWare. The BROADCAST command is also available in NetWare 4.

Syntax

At the Server Console

```
SEND "message" [[TO] username|connection number]  
[[AND | ,] username|connection number]
```



Note Unlike the client SEND command, *groupname* is not a valid parameter at the server.

Parameter	Use to
<i>message</i>	Specify the message (up to 55 characters) you want to send. Note: Quotation marks around the message are not required if you send the message to all users.
<i>username</i>	Specify the users you want to send the message to. To send to all users, don't include any usernames or connection numbers.
	Separate users with a comma, a space, or "and."
	Depending on the connection type, you need to specify either the user's complete name (for example, BOB.SALES.NOVELL), or the user's name (For example, BOB).
	Use the user name as it appears in "Connection Information" in MONITOR.
<i>connection number</i>	Specify the number of the station you want to send the message to. Separate connection numbers with a comma, a space, or "and."
	To determine the connection number, find the corresponding connection number next to the user's name in "Connection Information" in MONITOR.

At a Workstation**Workstations on NDS Servers (NetWare 4)**

```
SEND ["message" [TO] [username | groupname |  
    servername]] [/options...] [/? | /VER]
```

Parameter	Use to
<i>message</i>	Specify the message you want to send.
<i>username</i> , <i>groupname</i> , or <i>servername</i>	Specify the recipient of the message.
	Separate multiple names with a comma, a space, or <i>and</i> .
<i>/option</i>	Replace <i>option</i> with any available option. See "SEND Options" on page 289.
/?	View online help. All other parameters are ignored when /? is used.

SEND Options

Option	Use to
/A=A or /A	Accept all messages.
/A=C	Accept messages only from the server console.
/A=N	Accept no messages.
/A=P	Stores the last message sent until you poll to receive it.
/P	Poll the server for the last stored message.
/S	Show the current broadcast mode.
/B	Send across a bindery connection when logged in to NDS.

Workstations on Bindery Servers (NetWare 2 and 3)

```
SEND "message" [TO] [servername/ [username |
groupname | station number]]
[servername/ [/option...]] [/? | /VER]
```

Parameter	Use to
<i>message</i>	Specify the message you want to send.
<i>servername</i>	Specify the server the user is logged in to. If no server is specified, the message is sent to the server your current drive is mapped to.
<i>username or groupname</i>	Specify the recipient of the message.
	Separate multiple names with a comma, a space, or <i>and</i> .
<i>station number</i>	Specify a workstation connection number. Separate multiple numbers with a comma, a space, or <i>and</i> .

Parameter	Use to
/option	Specify any available option. See “Options for Workstations on Bindery Servers” on page 290.
/?	View online help.
/VER	View the version number of the utility and the list of files it uses to execute.

Options for Workstations on Bindery Servers

Option	Use this option to
EVERYONE	Sends message to members of the group EVERYONE.
CONSOLE	Sends message to the server console.
/B	Allows bindery syntax from an NDS connection.

Using SEND

- ◆ All users except the following receive messages:
 - ◆ Those who used SEND at the workstation with the “Accept None” option.
 - ◆ Those logged in using ACS or NACS.
 - ◆ Those logged in on remote workstations.
 - ◆ Those using some graphics applications.
 - ◆ Those who are attached to the server but not logged in.
- ◆ Messages don’t interfere with a workstation’s display; however, the user can’t make entries on the screen until messages are cleared.

Examples

Workstation Examples

- ◆ To send the message "Time for the meeting" to Bob, Sue, and Jeff, type

SEND "TIME FOR THE MEETING" BOB, SUE, JEFF

- ◆ To send the message "Time for the meeting" to Bob, using a complete name, type

SEND "TIME FOR THE MEETING" .BOB.NOVELL

- ◆ To send the message "Time for the meeting" to KELLEY on bindery server FRIENDLY (if you are logged in to NDS), type

SEND "TIME FOR THE MEETING" FRIENDLY/KELLEY /B

(If you are not logged in to NDS, you don't need to use /B.)

- ◆ To set your workstation to receive only console or system messages, type

SEND /A=C

- ◆ To clear a message from a workstation and resume work, type

<Ctrl>+<Enter>

SEND

Server Examples

- ◆ To send the message "The server is going down" to all users logged in or attached to the server, type

SEND "THE SERVER IS GOING DOWN"

- ◆ To send "The server is going down" to user ANDREA, type

SEND "THE SERVER IS GOING DOWN" ANDREA

- ◆ To send "Log out please" to user ANDREA, using the complete name, type

SEND "LOG OUT PLEASE" ANDREA.SALES.NOVELL

- ◆ To send "Paychecks are here!" to connection 1 (from a bindery connection), type

"Paychecks are here!" 1

- ◆ To send "Meeting time" to users ANDREA, BRYAN, and MICHAEL and to stations 1 and 4, type

SEND "MEETING TIME" TO ANDREA, BRYAN, MICHAEL, 1, 4

Additional Information

Topic	See
Using SEND to send a message from the console	" <i>Sending Console Messages to Workstations</i> " in Chapter 7 of <i>Supervising the Network</i> .
Bindery-based server	"Bindery" in <i>Concepts</i> .
Stopping message displays	" <i>Sending Console Messages to Workstations</i> " in Chapter 7 of <i>Supervising the Network</i> .

SERVER

Purpose

Use at the server console from the DOS prompt to

- ◆ Boot NetWare on your server
- ◆ Execute the STARTUP.NCF file
- ◆ Mount volume SYS:
- ◆ Execute the AUTOEXEC.NCF file
- ◆ Execute the INITSYS.NCF file

Syntax

SERVER [parameter]

Parameter	Use to
-s [path]filename.NCF	Specify an alternative to STARTUP.NCF. Replace <i>filename</i> with the name of the alternate file. (The file extension must be .NCF) The system looks for the file in the current boot directory, unless you specify a path.
-na	Prevent the AUTOEXEC.NCF file that you created in INSTALL from executing. This parameter is useful if you are changing drivers or other commands in your AUTOEXEC.NCF file.

Parameter	Use to
-ns	Prevent the STARTUP.NCF and AUTOEXEC.NCF files created in INSTALL from executing. This parameter is useful for changing the boot process.

Using SERVER

- ◆ SERVER is a DOS-executable file that boots the NetWare operating system.
- ◆ If neither of the .NCF files exists, SERVER prompts you for a server name and an IPX internal network number; SERVER then brings up the console prompt (:).
- ◆ To automatically bring up the server when you boot up the machine, you can do one of the following:
 - ◆ Place the SERVER command in the AUTOEXEC.BAT file in your boot partition.
 - ◆ Use REMOVE DOS to boot the NetWare operating system automatically after you down the server and use the EXIT command.
- ◆ SERVER executes STARTUP.NCF and AUTOEXEC.NCF, if they exist.

Additional Information

Topic	See
Restarting server execution from the console prompt	"RESTART SERVER" on page 260.
Editing NCF files	"Creating or Editing a Server Batch (.NCF) File" in Chapter 7 of <i>Supervising the Network</i> .

SERVMAN

Purpose

Use at the server console to

- ◆ View and configure system parameters
- ◆ Change system parameter values in the AUTOEXEC.NCF, STARTUP.NCF, and TIMESYNC.CFG files
- ◆ View volume, storage, network, adapter, device, and disk partition information

Note  SERVMAN has the same functionality as the SET command.

Syntax

LOAD SERVMAN

Using SERVMAN

The SERVMAN (Server Manager) main screen displays statistics about the server, such as processor use, processor speed, and number of modules loaded. See Figure 2-20.

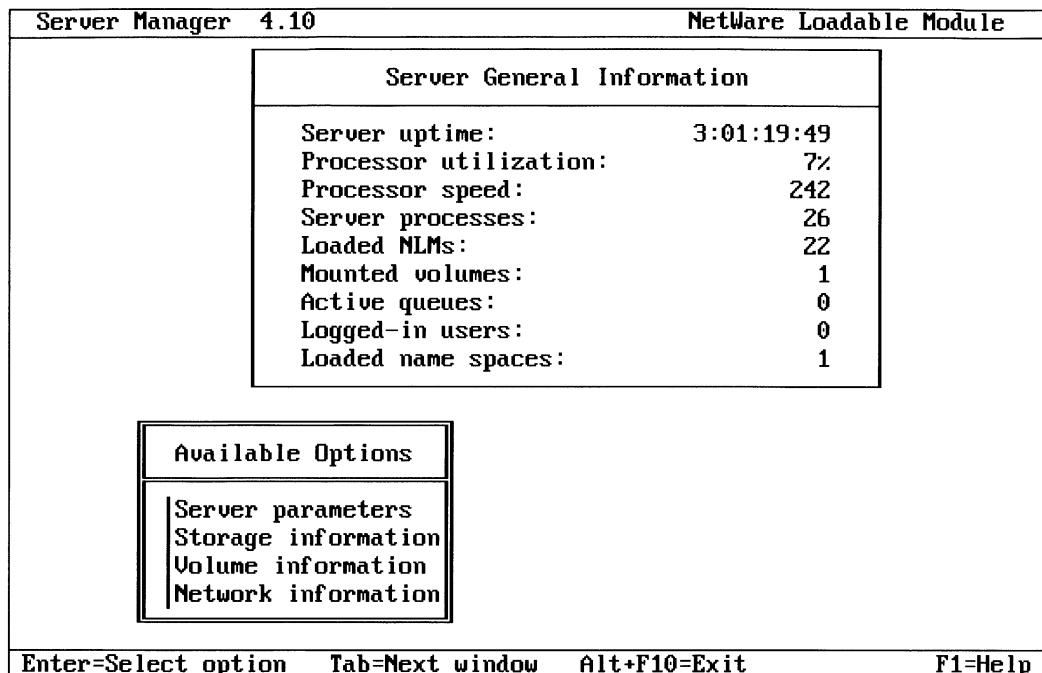
The main screen also displays an “Available Options” menu. These options give you access to more detailed information.

Earlier versions of SERVMAN allowed you to configure IPX/SPX. Configuration of IPX/SPX is now done through the INETCFG utility. See “INETCFG” on page 95.

Note  For more information, press **<F1>** while you are in the utility.

SERVMAN

Figure 2-20
The SERVMAN Main
Screen



Statistics Displayed on the SERVMAN Main Screen

The SERVMAN utility updates statistics every second.

Statistic	Explanation
Server uptime	Length of time the server has been running since it was last booted.
Processor utilization	Percentage of time that the server CPU is busy.
Processor speed	Speed at which the processor is running, based on CPU clock speed, CPU type, and the number of memory wait states.
Server processes	Number of processes running on the server.
Loaded NLMs	Number of modules loaded on the server.
Mounted volumes	Number of volumes mounted on the server.
Active queues	Number of active queues on the server.
Logged-in users	Number of users logged in to the server.
Loaded name spaces	Number of name spaces loaded on the server.

Selections in the SERVMAN “Available Options” Menu

Menu Option	Use to
Server parameters	<ul style="list-style-type: none">◆ View and configure operating system parameters.◆ Change system parameter values in the AUTOEXEC.NCF and STARTUP.NCF files.
Storage information	View adapter, device, and partition information.
Volume information	View information about volumes mounted on the server.
Network information	View network information, such as number of packets received and transmitted.

Additional Information

Topic	See
SET command	“SET” (page 299).

SET

Purpose

Use at the server console to view and configure operating system parameters.

Note  You can also use SERVMAN to configure and set operating system parameters.

The default SET parameters give maximum performance for most systems. Network supervisors should seldom need to change parameters.

Syntax

SET [parameter] = [value]

Parameters:

Communication Parameters (page 302)
Memory Parameters (page 307)
File Caching Parameters (page 310)
Directory Caching Parameters (page 313)
File System Parameters (page 319)
Lock Parameters (page 329)
Transaction Tracking Parameters (page 331)
Disk Parameters (page 333)
Time Synchronization Parameters (page 335)
NCP Parameters (page 342)
Miscellaneous Parameters (page 346)
Error Handling Parameters (page 353)
NetWare Directory Services Parameters (page 355)
SFT III Parameters (page 360)

Using SET

Although most parameters don't need to be changed, you might increase the performance of your system by changing some parameters. Suggestions for improving server performance can be found in "Monitoring and Optimizing the Server," in Chapter 7 of *Supervising the Network*.

Displaying and Changing Current Settings

- ◆ If you type SET without a parameter, a list of categories appears. When you select a category, the current settings for the parameters in that category appear, along with the setting limits and a brief description of each parameter.
- ◆ If you type SET with a parameter but no value, the current setting, setting limits, and a brief description of the parameter appear.
- ◆ If you type SET with a parameter and a value, the operating system is reconfigured according to the specified value.
- ◆ You can also use the SERVMAN NLM to display and modify parameter settings. See "SERVMAN" on page 295.

Entering Parameters

- ◆ You can use most SET parameters at the console prompt. The system is immediately configured to that setting. Any setting in the AUTOEXEC.NCF file is overridden until the server is rebooted.
- ◆ You can save SET commands you execute at the console prompt in the AUTOEXEC.NCF file. When a parameter is saved, the server configures itself to the parameter each time the server is booted.

If the parameter isn't saved in the file, the system returns to the default setting for the parameter when the server is booted. Some commands can be saved in the STARTUP.NCF file.

Edit the AUTOEXEC.NCF or the STARTUP.NCF file with INSTALL. If you use SERVMAN to change SET parameters, you are prompted to update .NCF files before exiting the utility.

Parameters that Control the Allocation of Services

Some SET parameters control how the system dynamically allocates services. Three types of parameters interact to control the allocation of a service:

- ◆ Maximum limits control how many resources the operating system can allocate for a particular service.
- ◆ Minimum limits allow the operating system to allocate a minimum number of resources as soon as a request is received.

Low minimum limits slow the growth of a particular service. High minimum limits allow rapid growth.

For example, if the minimum number of directory cache buffers is set to 20, the system allocates another buffer resource as soon as a request is made until 20 cache buffers have been allocated.

When 20 directory cache buffers are allocated, the system waits 2.2 seconds (default) when a request comes in, and then allocates another buffer if the request is still active.

However, if the minimum number of directory cache buffers is set to 40, the system allocates 40 directory cache buffers before it starts slowing the growth by waiting 2.2 seconds after each request.

- ◆ Wait time limits control how rapidly the operating system can allocate a new resource.

Communication Parameters

Communication parameters control settings for communication buffers. Four parameters configure packet receive buffers; four control the watchdog.

- ◆ Packet Receive Buffers are areas in the server's memory that are set aside to hold data packets. The packets remain in the buffers while the server processes them.
- To view the number of packet receive buffers allocated, use MONITOR.
- ◆ Watchdog Packets make sure stations are connected. If the server doesn't receive a packet from a station within a set time (Delay Before First Watchdog Packet), a watchdog packet is sent to the station.
- ◆ If the station doesn't respond within a set time (Delay Between Watchdog Packets), another packet is sent. If the station doesn't respond to a set number of packets, the server assumes that the station is no longer connected and clears the station's connection.

See Table 2-4 for a description of communication parameters.

Table 2-4
Communication Parameters

Parameter	Use to
Maximum Packet Receive Buffers = <i>number</i>	<p>Specify the maximum number of packet receive buffers the operating system can allocate.</p> <p>Supported values: 50 to 4000. Default: 100.</p> <p>Note: For SFT III systems, the default is 400.</p> <p>Before increasing this parameter, use MONITOR to view the server's use of packet receive buffers and service processes.</p> <p>If the number of packet receive buffers is at maximum, increase this parameter in increments of 10 until you have one packet receive buffer per workstation.</p> <p>If you have EISA or microchannel bus master boards in your server, increase this parameter to provide at least five buffers per board.</p> <p>If the board is producing "No ECB available count" errors, provide 10 buffers per board. Use MONITOR ("LAN Information") to determine if the board is producing errors.</p> <p>If the number of allocated service processes is at maximum, you can increase the "Maximum Service Processes" parameter to decrease the need for more packet receive buffers.</p> <p>The value of this parameter should be greater than the value of the Minimum Packet Receive Buffers parameter. If it is less, the system increases the value to match that of the Minimum Packet Receive Buffers parameter.</p> <p>This parameter can be set in the appropriate startup .NCF file.</p>

Table 2-4 *continued*
Communication Parameters

Parameter	Use to
Minimum Packet Receive Buffers = <i>number</i>	<p>Specify the minimum number of packet receive buffers the operating system can allocate. The operating system allocates this number of buffers as soon as the server boots. You must add this command to the STARTUP.NCF file. You cannot change the setting at the console prompt.</p> <p>Supported values: 10 to 2000. Default: 50.</p> <p>Note: For SFT III systems, the default is 100. This parameter must be set to the same value in the MSSTART.NCF and IOSTART.NCF files.</p> <p>Before increasing this parameter, use MONITOR to view the server's use of packet receive buffers.</p> <p>If you have EISA or microchannel bus master boards in your server and are receiving "No ECB available count" errors (see "LAN Information" in "MONITOR" on page 141) right after the server boots, increase this parameter so that each board can have at least five packet receive buffers.</p> <p>If the allocated number is higher than 10 and the server doesn't respond immediately after booting, increase this parameter.</p> <p>In NetWare 4.1, the value of this parameter must be less than the value of the Maximum Packet Receive Buffers parameter. If it is greater, the system increases the value of the Maximum Packet Receive Buffers parameter to match that of the Minimum Packet Receive Buffers parameter.</p>

Table 2-4 *continued*
Communication Parameters

Parameter	Use to
Maximum Physical Receive Packet Size = <i>number</i>	<p>Specify the maximum size of packets that can be transmitted on the network. You must add this command to the STARTUP.NCF file. You cannot change the setting at the console prompt.</p> <p>Supported values: 618 to 24682. Default: 4202.</p> <p>The default allows 2 KB (data with the packet header). If you use token ring or Ethernet boards, the default is acceptable.</p> <p>If some of your network boards transmit more than 512 bytes of data per packet, set this parameter for the largest packet size.</p>
IPX NetBIOS Replication Option = <i>number</i>	<p>Specify how the IPX router handles replicated NetBIOS broadcasts.</p> <p>Supported values:</p> <ul style="list-style-type: none"> 0 = Do not replicate NetBIOS broadcasts. 1 = Duplicate broadcasts when there are redundant routes. 2 = Suppress duplicate broadcasts. <p>Default: 2.</p>
Maximum Interrupt Events = <i>number</i>	<p>Specify the maximum number of interrupt time events (such as IPX routing) allowed before a thread switch is guaranteed to have occurred.</p> <p>Supported values: 1 to 1000000. Default: 10.</p>
Reply to Get Nearest Server = <i>value</i>	<p>Specify whether the server responds to "Get Nearest Server" requests from stations trying to locate directory and file servers.</p> <p>This parameter can be set in the STARTUP.NCF file, if desired.</p> <p>Supported values: ON, OFF. Default: ON.</p>

Table 2-4 *continued*
Communication Parameters

Parameter	Use to
Number of Watchdog Packets = <i>number</i>	Specify the number of unanswered watchdog packets that the server sends to a workstation before closing its connection. Supported values: 5 to 100. Default: 10.
Delay Between Watchdog Packets = <i>time</i>	Specify the amount of time between watchdog packets. Supported values: 9.9 seconds to 10 minutes 26.2 seconds. Default: 59.3 seconds. After a server sends out the first watchdog packet, it waits the specified time before sending out succeeding packets if it receives no reply.
Delay Before First Watchdog Packet = <i>time</i>	Specify the amount of time the server waits without receiving a request from a workstation before sending out the first watchdog packet to that station. Supported values: 15.7 seconds to 14 days. Default: 4 minutes 56.6 seconds.
New Packet Receive Buffer Wait Time = <i>time</i>	Specify how long the operating system waits after receiving a request for a packet receive buffer before granting a new buffer. Supported values: 0.1 second to 20 seconds. Default: 0.1 second. This parameter prevents the system from granting too many buffers during a sudden peak in usage. If you have an EISA bus master board in your server, don't change this parameter.

Table 2-4 *continued*
Communication Parameters

Parameter	Use to
Console Display Watchdog Logouts = <i>value</i>	<p>Specify whether a console message is displayed when a connection is cleared.</p> <p>Supported values: ON, OFF. Default: OFF.</p> <p>If your network is running smoothly, you don't need to display watchdog logouts.</p> <p>If your workstations are having connection problems, the watchdog logout messages can help you isolate which stations aren't receiving or sending watchdog packets.</p>

Memory Parameters

Memory parameters control the size of the dynamic memory pool and the automatic registering of memory on EISA bus computers.

For a description of memory parameters, see Table 2-5.

Table 2-5
Memory Parameters

Parameter	Use to
Allow Invalid Pointers = <i>value</i>	<p>Specify whether invalid pointers are allowed to cause a nonexistent page to be mapped in with only one notification.</p> <p>This parameter can be set in the STARTUP.NCF file, if desired.</p> <p>Supported values: ON, OFF. Default: OFF.</p>
Read Fault Notification = <i>value</i>	<p>Specify whether the console and error log are notified of emulated read page faults.</p> <p>This parameter can be set in the STARTUP.NCF file, if desired.</p> <p>Supported values: ON, OFF. Default: ON.</p>

Table 2-5 *continued*
Memory Parameters

Parameter	Use to
Read Fault Emulation = <i>value</i>	<p>Specify whether a read that occurs from a nonpresent page is emulated.</p> <p>This parameter can be set in the STARTUP.NCF file, if desired.</p> <p>Supported values: ON, OFF. Default: OFF.</p>
Write Fault Notification = <i>value</i>	<p>Specify whether the console and error log are notified of emulated write page faults.</p> <p>This parameter can be set in the STARTUP.NCF file, if desired.</p> <p>Supported values: ON, OFF. Default: ON.</p>
Write Fault Emulation = <i>value</i>	<p>Specify whether a write that occurs from a nonpresent page is emulated.</p> <p>This parameter can be set in the STARTUP.NCF file, if desired.</p> <p>Supported values: ON, OFF. Default: OFF.</p>
Garbage Collection Interval = <i>number</i>	<p>Specify the maximum time between garbage collections.</p> <p>This parameter can be set in the STARTUP.NCF file, if desired.</p> <p>Supported values: 1 minute to 1 hour. Default: 15 minutes.</p>
Number of Frees for Garbage Collection = <i>number</i>	<p>Specify the minimum number of times memory must be freed before a garbage collection can occur.</p> <p>This parameter can be set in the STARTUP.NCF file, if desired.</p> <p>Supported values: 100 to 100000. Default: 5000.</p>

Table 2-5 *continued*
Memory Parameters

Parameter	Use to
Minimum Free Memory for Garbage Collection = <i>number</i>	<p>Specify the minimum free allocation bytes needed for garbage collection.</p> <p>This parameter can be set in the STARTUP.NCF file, if desired.</p> <p>Supported values: 1000 to 1000000. Default: 8000.</p>
Alloc Memory Check Flag = <i>value</i>	<p>Specify whether the server will do corruption checking in the alloc memory nodes.</p> <p>This parameter can be set in the STARTUP.NCF file, if desired.</p> <p>Supported values: ON, OFF. Default: OFF.</p>
Auto Register Memory Above 16 Megabytes = <i>value</i>	<p>Control the automatic registering of memory above 16 MB in EISA computers.</p> <p>Supported values: ON, OFF. Default: ON.</p> <p>You must set this parameter in the STARTUP.NCF file. You cannot set the value at the command line.</p> <p>Use OFF if you have installed a network board or a disk adapter board that uses an online DMA or AT bus. (The board can address only 16 MB of memory correctly.)</p> <p>If you install one of these boards and the server addresses more than 16 MB of memory, the board corrupts server memory because it addresses low memory instead of its assigned high memory and corrupts the low memory in use.</p> <p>Use ON if you want memory above 16 MB to be registered with the operating system.</p>

Table 2-5 *continued*
Memory Parameters

Parameter	Use to
Reserved Buffers Below 16 Meg = <i>number</i>	<p>Specify the number of file cache buffers reserved for device drivers that can't access memory above 16 MB.</p> <p>Supported values: 8 to 300. Default: 16.</p> <p>You must set this parameter in the STARTUP.NCF file. You cannot set the value at the command line.</p>

File Caching Parameters

File caching allows faster access to frequently used files by holding a file (or a portion of it) in memory. Files being read from or written to are kept in file cache buffers.

The number of files kept in memory depends on the number of file cache buffers allowed. This is determined by the amount of memory available and the Minimum File Cache Buffers parameter.

See Table 2-6 for a description of file caching parameters.

Table 2-6
File Caching Parameters

Parameter	Use to
Read Ahead Enabled = <i>value</i>	<p>Specify whether the system conducts background reads to cache in advance of blocks soon to be requested.</p> <p>Supported values: ON, OFF. Default: ON</p> <p>Read-aheads can happen only when sequential file accesses are occurring.</p>
Read Ahead LRU Sitting Time Threshold = <i>number</i>	<p>Specify the minimum cache LRU (least recently used) sitting time for read-aheads to take place.</p> <p>Supported values: 0 seconds to 1 hour. Default: 10 seconds.</p>

Table 2-6 *continued*
File Caching Parameters

Parameter	Use to
Minimum File Cache Buffers = <i>number</i>	<p>Set the minimum number of cache buffers the operating system can allow for file caching.</p> <p>Supported values: 20 to 1000. Default: 20.</p> <p>All memory not allocated for other processes is given to file caching. As memory is requested for other processes, the server gives up cache buffers.</p> <p>This limit specifies when the server must stop giving file cache buffers to other processes.</p> <p>If you set the minimum too high, other processes may not be able to allocate necessary memory resources.</p> <p>For example, a module could fail to load because the server is out of available memory.</p>
Maximum Concurrent Disk Cache Writes = <i>number</i>	<p>Specify the number of write requests for changed file data that can be put in the elevator before the disk head begins a sweep across the disk.</p> <p>Supported values: 10 to 4000. Default: 50.</p> <p>A high number creates more efficient write requests. A low number creates more efficient read requests.</p> <p>Monitor the number of dirty cache buffers on the information screen in MONITOR.</p> <p>If this number is above 70% of total cache buffers, optimize the write speed by increasing this parameter.</p>

Table 2-6 *continued*
File Caching Parameters

Parameter	Use to
Dirty Disk Cache Delay Time = <i>time</i>	<p>Specify how long the system keeps a write request (that does not fill a cache buffer) in memory before writing the request to disk.</p> <p>Supported values: 0.1 second to 10 seconds. Default: 3.3 seconds.</p> <p>Increasing the time makes disk writing more efficient if your users make many small write requests.</p> <p>Decreasing the time can reduce performance drastically, and reduces the chances of losing data only slightly.</p>
Minimum File Cache Report Threshold = <i>number</i>	<p>Specify how few cache buffers can be available before the operating system warns you that the number of buffers is getting low.</p> <p>Supported values: 0 to 1000. Default: 20</p> <p>For example, if the Minimum File Cache Buffers parameter is set to 20 and this parameter is set to 25, you are warned when all but 45 cache buffers are allocated for other processes.</p> <p>Regardless of how this parameter is set, the operating system warns you when it reaches the minimum number of cache buffers. You receive the following message: "Cache memory allocator exceeded minimum cache buffer left limit."</p>

Directory Caching Parameters

Directory caching allows fast access to frequently used directories. A *directory cache buffer* is a portion of NetWare server memory that holds entries from the directory table.

A directory entry stays in a cache buffer as long as it is accessed frequently (default: 33 seconds). The system can overwrite the directory entry if the allocated directory cache buffers are accessed more frequently.

See Table 2-7 for a description of directory caching parameters.

Allocation of Directory Cache Buffers

When the server boots, the system allocates a minimum number of directory cache buffers (default: 20). It creates these buffers immediately when it receives a request for a new buffer.

When the minimum number of buffers is allocated and another is needed, the system must wait a specified amount of time before allocating another buffer.

If necessary, the system allocates buffers until it reaches the maximum. If enough directory cache buffers are allocated and enough memory is available for directory caching, all directory tables can be cached in memory.

How Directory Caching and File Caching Work Together

As directory cache buffers increase, file cache buffers decrease. Thus, a tradeoff exists between directory caching and file caching.

Directory caching and file caching must be balanced carefully for maximum performance.

If you adjust the system to use too much memory for directory caching, you can leave too little memory for file caching, and vice versa.

Table 2-7
Directory Caching Parameters

Parameter	Use to
Dirty Directory Cache Delay Time = <i>time</i>	<p>Specify how long the system keeps a directory table write request in memory before writing it to disk.</p> <p>Supported values: 0 to 10 seconds. Default: 0.5 second</p> <p>Increasing the delay time gives slightly quicker performance but increases the probability of the directory tables becoming corrupted.</p> <p>Decreasing the delay time slightly reduces the chance of directory tables becoming corrupted, but can reduce performance slightly.</p> <p>A zero setting reduces performance dramatically.</p>
Maximum Concurrent Directory Cache Writes = <i>number</i>	<p>Specify how many write requests from directory cache buffers are put in the elevator before the disk head begins a sweep across the disk.</p> <p>Supported values: 5 to 50. Default: 10.</p> <p>A high number creates more efficient write requests. A low number creates more efficient read requests.</p>

Table 2-7 *continued*
Directory Caching Parameters

Parameter	Use to
Directory Cache Allocation Wait Time = <i>number</i>	<p>Specify how long the system must wait after allocating a new directory cache buffer before it can allocate another buffer.</p> <p>Supported values: 0.5 second to 2 minutes. Default: 2.2 seconds.</p> <p>During this time, all requests for a new directory cache buffer are ignored.</p> <p>If the wait time is too low, peak usage requests cause more resources than necessary to be allocated to directory caching.</p> <p>If the wait time is too high, the system is very slow in allocating the directory cache buffers necessary to service the usual number of directory requests.</p> <p>If directory searches seem slow even after the server has been running for 15 minutes, you may want to decrease this parameter.</p>
Directory Cache Buffer NonReferenced Delay = <i>time</i>	<p>Specify how long a directory entry must be cached before it can be overwritten by another directory entry.</p> <p>Supported values: 1 second to 5 minutes. Default: 5.5 seconds.</p> <p>Increasing this parameter speeds directory access. The system allocates more directory cache buffers, and a directory is more likely to be cached in memory.</p> <p>Decreasing this parameter slows directory access but also reduces the need for directory cache buffers.</p>

Table 2-7 *continued*

Directory Caching Parameters

Parameter	Use to
Maximum Directory Cache Buffers = <i>number</i>	<p>Specify the maximum number of cache buffers that the system can allocate for directory caching.</p> <p>Supported values: 20 to 4000.</p> <p>Default: 500.</p> <p>This parameter keeps the system from allocating too many directory cache buffers so that memory is available for other server processes.</p> <p>Increase this limit if the server responds slowly to directory searches.</p> <p>Decrease this limit if too much memory is being allocated for directory caching.</p> <p>If users are warned that the server is low on memory, this parameter should be one of the first to be reduced. (Reboot the server to return the memory to the cache buffer memory pool.)</p> <p>When a directory cache buffer is allocated, the allocation is permanent until the server reboots; the buffers don't return to file caching when the need for directory cache buffers decreases.</p>

Table 2-7 *continued*
Directory Caching Parameters

Parameter	Use to
Minimum Directory Cache Buffers = <i>number</i>	<p>Specify the minimum number of cache buffers that the system can allocate for directory caching.</p> <p>Supported values: 10 to 2000. Default: 20.</p> <p>The number needs to be high enough that directory searches can be done quickly, but no higher than necessary.</p> <p>If the system doesn't need the minimum number of directory cache buffers, the buffers can't be reallocated to file caching. The unneeded portion remains unused.</p> <p>If the server responds slowly to directory searches after it is booted, monitor the number of directory cache buffers usually allocated for directory caching.</p> <p>If the number is significantly higher than this limit, consider increasing the limit to remove the delay time that normally occurs while the server is self-configuring. Use MONITOR to view the current statistics.</p>
Maximum Number of Directory Handles = <i>number</i>	<p>Specify the maximum number of directory handles available for each connection.</p> <p>Supported values: 20 to 1000. Default: 20.</p> <p>A directory handle is a version of the directory access rights that is held in cache memory. Caching the access rights speeds mapping to the rights.</p> <p>Each time a connection accesses a file or directory, a directory handle is allocated (up to the total specified by this parameter).</p>

Table 2-7 *continued*

Directory Caching Parameters

Parameter	Use to
Maximum Number of Internal Directory Handles = <i>number</i>	<p>Specify the maximum number of directory handles available for internal NLMs that use connection 0.</p> <p>Supported values: 40 to 1000. Default: 100.</p> <p>A directory handle is a version of the directory access rights that is held in cache memory. Caching the access rights speeds mapping to the rights.</p> <p>Connection 0 is the connection number reserved for use by the server itself and by NLMs operating within the server.</p> <p>Each time an NLM program using connection zero accesses a file or directory, a directory handle is allocated (up to the total specified by this parameter). This value represents the total number of handles available to be shared by all NLMs using connection 0.</p>

File System Parameters

- ◆ Three parameters control warnings about volumes that are almost full.
- ◆ Four parameters control file purging. File-purging parameters influence other parameters, which in turn control warnings about almost-full volumes.

All deleted files remain on the disk for a specified minimum amount of time. The system calculates a volume's remaining space by subtracting the following from the total space:

- ◆ Actual files
- ◆ Salvageable files that can't be purged because their "Minimum File Delete Wait Times" have not expired
- ◆ One parameter controls the reuse of turbo FATs.
- ◆ Eight parameters control file compression.

See Table 2-8 for a description of file system parameters.

Table 2-8
File System Parameters

Parameter	Use to
Minimum File Delete Wait Time = <i>time</i>	<p>Specify how long a deleted file remains salvageable on the volume.</p> <p>Supported values: 0 seconds to 7 days. Default: 1 minute 5.9 seconds.</p> <p>Files deleted for less than this minimum aren't automatically purged even if the volume is full and users can't create new files.</p>
File Delete Wait Time = <i>time</i>	<p>Specify when a salvageable file can be purged to create free space on a volume.</p> <p>Supported values: 0 seconds to 7 days. Default: 5 minutes 29.6 seconds.</p> <p>Set this parameter as high as is useful for your users, but this parameter doesn't guarantee that a file remains salvageable.</p> <p>The system tries to keep at least 1/32 of available space on the volume free for new files.</p> <p>This parameter only guarantees that files aren't purged to maintain this free disk space.</p> <p>Files that haven't met this time limit are purged if the volume is full and the system needs space for a user to create a new file.</p> <p>When a deleted file remains on the server longer than the File Delete Wait Time parameter setting, the system marks the file as purgeable.</p> <p>When the volume is full of purgeable files and needs free space, the oldest purgeable files are purged.</p>
Allow Deletion of Active Directories = <i>value</i>	<p>Specify whether a directory can be deleted when another connection has a drive mapped to it.</p> <p>Supported values: ON, OFF. Default: ON.</p>

Table 2-8 *continued***File System Parameters**

Parameter	Use to
Maximum Percent of Volume Space Allowed for Extended Attributes = <i>percentage</i>	Limit the portion of volume space used for extended attribute storage. The setting takes effect only when the volume is being mounted. Supported values: 5 to 50. Default: 10.
Maximum Extended Attributes per File or Path = <i>number</i>	Limit the number of extended attributes that can be assigned to a file or path (subdirectory). This limit applies to all volumes on the server. Supported values: 4 to 512. Default: 16.
Maximum Percent of Volume Used by Directory = <i>percentage</i>	Limit the portion of a volume that can be used as directory space. Supported values: 5 to 50. Default: 13.
Immediate Purge of Deleted Files = <i>value</i>	Controls whether deleted files can be salvaged. If this parameter is set to OFF, files can be salvaged with the FILER utility. See “FILER” on page 70. Supported values: ON, OFF. Default: OFF. If this parameter is set to ON, all files are purged immediately when they are deleted.

Table 2-8 *continued*
File System Parameters

Parameter	Use to
Maximum Subdirectory Tree Depth = <i>number</i>	<p>Specify how many levels of subdirectories the system supports.</p> <p>Supported values: 10 to 100.</p> <p>Default: 25.</p> <p>You must set this parameter in the STARTUP.NCF file. You cannot set the parameter at the command line.</p> <p>Increase the number if your applications support trees deeper than 25.</p> <p>Decrease the number if your applications support only shallow tree structures.</p> <p>(Some DOS applications can't support more than 10 levels if the subdirectories have 11-character names.)</p>
Volume Low Warn All Users = <i>value</i>	<p>Have the system notify users when a volume is almost full.</p> <p>Supported values: ON, OFF.</p> <p>Default: ON.</p> <p>If you choose not to have your server warn users, monitor volume statistics at least daily with SERVMAN or MONITOR.</p>

Table 2-8 *continued*
File System Parameters

Parameter	Use to
Volume Low Warning Reset Threshold = <i>number</i>	<p>Control how much disk space must be freed up before a second warning is issued that the volume is almost full. (The first warning is controlled by the “Volume Low Warn All Users” parameter.)</p> <p>Supported values: 0 to 100000 blocks. Default: 256 blocks.</p> <p>When a volume is almost full, it can hover at its warning threshold as users create and delete files.</p> <p>This parameter controls the minimum amount of space that must be made available above the threshold before the warning message disappears.</p> <p>Example: Assume the volume block size is 4 KB, the “Volume Low Warning Reset Threshold” is set to 256, the “Volume Low Warning Threshold” is set to 256, and the volume has less than 1 MB of free space.</p> <p>Given these conditions, the volume must gain at least 1 MB of free space (for a total of 2 MB of free space) and then dip below 1 MB before the system sends another warning that the volume is almost full.</p>

Table 2-8 *continued***File System Parameters**

Parameter	Use to
Volume Low Warning Threshold = <i>number</i>	<p>Specify the number of blocks of free disk space that can remain on a volume before the system issues a warning.</p> <p>Supported values: 0 to 1000000 blocks. Default: 256 blocks.</p> <p>Consider the following: A block is the minimum space allocated to a file; a file can grow only in multiples of the block size.</p> <p>The block's physical size is determined when the volume is created. A volume can be assigned these block sizes: 4 KB, 8 KB, 16 KB, 32 KB, or 64 KB.</p> <p>For example, if you enter 256 blocks for this parameter and the volume's block size is 4 KB, the system warns you that the volume is full when about 1 MB of space is left.</p> <p>If your volumes are assigned different block sizes, each volume has a different amount of free space when the warning is issued.</p>

Table 2-8 *continued***File System Parameters**

Parameter	Use to
Turbo FAT Re-Use Wait Time = <i>time</i>	<p>Specify how long a turbo FAT buffer remains in memory after an indexed file is closed.</p> <p>Supported values: 0.3 second to 1 hour 5 minutes 54.6 seconds.</p> <p>Default: 5 minutes 29.6 seconds.</p> <p>Once the wait-time value has passed, the system can allocate the buffer to another indexed file.</p> <p>Increase the wait time if</p> <ul style="list-style-type: none"> ◆ You want the turbo FAT index to remain in memory for long periods of time, even when the file is closed. ◆ You frequently reopen the same file after a specific delay and know that another file opened during that delay will reuse the index. <p>Decrease the wait time if you want the memory released immediately to service the next file that needs to be indexed.</p> <p>When a program randomly accesses a file that contains more than 64 FAT entries, the system builds a turbo FAT index for the file so that information is accessed quickly. (The NetWare 3 system indexes any randomly accessed file with 64 entries in the FAT.)</p> <p>The system doesn't immediately delete the index from its buffer when the file is closed.</p> <p>Having the turbo FAT index in memory makes reopening the file and accessing information faster.</p>

Table 2-8 *continued*
File System Parameters

Parameter	Use to
Compression Daily Check Stop Hour = <i>number</i>	<p>Specify the hour when you want the file compressor to stop scanning enabled volumes for files that need to be compressed.</p> <p>Supported values: 0 to 23. Default: 6.</p> <p>Hours are specified by a 24-hour clock: 0 = midnight; 23 = 11 p.m.</p> <p>This parameter can be set in the STARTUP.NCF file, if desired.</p>
Compression Daily Check Starting Hour = <i>number</i>	<p>Specify the hour when you want the file compressor to start scanning enabled volumes for files that need to be compressed.</p> <p>Supported values: 0 to 23. Default: 0.</p> <p>Hours are specified by a 24-hour clock: 0 = midnight; 23 = 11 p.m.</p> <p>Note: If the Compression Daily Check Stop Hour parameter is the same as the "Compression Daily Check Starting Hour," then the file compressor starts checking every day at the Compression Daily Starting Hour time and runs as long as necessary to finish all files that meet the compressible criteria.</p> <p>This parameter can be set in the STARTUP.NCF file, if desired.</p>
Minimum Compression Percentage Gain = <i>number</i>	<p>Set the minimum percentage a file must compress to remain in a compressed state.</p> <p>Supported values: 0 to 50. Default: 2.</p> <p>This parameter can be set in the STARTUP.NCF file, if desired.</p>

Table 2-8 *continued***File System Parameters**

Parameter	Use to
Enable File Compression = <i>value</i>	<p>Specify whether file compression is suspended.</p> <p>Supported values: ON, OFF. Default: ON.</p> <p>ON allows file compression on compression-enabled volumes.</p> <p>OFF suspends compression; immediate compress requests are queued until value is reset to ON, when the files meeting criteria will be compressed.</p> <p>This parameter can be set in the STARTUP.NCF file, if desired.</p>
Maximum Concurrent Compressions = <i>number</i>	<p>Specify the maximum concurrent or simultaneous compressions allowed.</p> <p>Supported values: 1 to 8. Default: 2.</p> <p>Concurrent compressions can occur only if there are multiple volumes.</p> <p>This parameter can be set in the STARTUP.NCF file, if desired.</p>
Convert Compressed to Uncompressed Option = <i>value</i>	<p>Specify what the system does with an uncompressed version of a file after the server has uncompressed it.</p> <p>Supported values:</p> <p>0 = Always leave the file compressed. 1 = Leave the file compressed until second access if it is read only once during the time specified by the Days Untouched Before Compression parameter. 2 = Always leave the file uncompressed.</p> <p>Default: 1</p> <p>This parameter can be set in the STARTUP.NCF file, if desired.</p>

Table 2-8 *continued*

File System Parameters

Parameter	Use to
Decompress Percent Disk Space Free to Allow Commit = <i>number</i>	<p>Specify the percentage of free disk space required on a volume for file uncompression to permanently change compressed files to uncompressed.</p> <p>Supported values: 0 to 75. Default: 10.</p> <p>This parameter prevents newly uncompressed files from filling up the volume.</p> <p>This parameter can be set in the STARTUP.NCF file, if desired.</p>
Decompress Free Space Warning Interval = <i>number</i>	<p>Specify the time between alerts when the file system is not changing compressed files to uncompressed because of insufficient disk space.</p> <p>Supported values: 0 seconds to 29 days 15 hours 50 minutes 3.8 seconds. Default: 31 minutes 18.5 seconds.</p> <p>This parameter can be set in the STARTUP.NCF file, if desired.</p>
Deleted Files Compression Option = <i>number</i>	<p>Specify whether and when deleted files are compressed.</p> <p>Supported values:</p> <ul style="list-style-type: none"> 0 = Don't Compress deleted files. 1 = Compress deleted files the next day. 2 = Compress deleted files immediately. <p>Default: 1.</p> <p>This parameter can be set in the STARTUP.NCF file, if desired.</p>
Days Untouched Before Compression = <i>number</i>	<p>Specify the number of days the system waits after a file was last accessed before it is compressed</p> <p>Supported values: 0 to 100000. Default: 7.</p> <p>This parameter can be set in the STARTUP.NCF file, if desired.</p>

Table 2-8 *continued*
File System Parameters

Parameter	Use to
Allow Unowned Files To Be Extended = value	<p>Specify whether files can be modified when the owner has been lost or deleted.</p> <p>Supported values: ON, OFF. Default: ON</p> <p>This parameter can be set in the STARTUP.NCF file, if desired.</p>

Lock Parameters

Lock parameters control

- ◆ How many open files each workstation can have
- ◆ How many open files the system can handle
- ◆ How many record locks each connection can have
- ◆ How many record locks the system can handle

There are three types of locks:

- ◆ File locks secure the file and prevent other stations from accessing it.
- ◆ Physical record locks control data access by multiple users. They prevent other users from accessing or changing a range of bytes (a record) in a file.

Physical record locks are enforced by the system. If a user tries to access a range of bytes that is physically locked, the user receives an "Access Denied" error message.

- ◆ Logical record locks also control data access by multiple users. The application assigns a name to each section of data that needs to be locked. The application then locks this name whenever it accesses the data.

Logical locks are enforced only to the extent that the application checks the name each time it needs access to data.

See Table 2-9 for a description of lock parameters.

Table 2-9
Lock Parameters

Parameter	Use to
Maximum Record Locks Per Connection = <i>number</i>	<p>Control how many record locks a workstation can use at one time. (Use MONITOR to view how many record locks a station is using.)</p> <p>Supported values: 10 to 100000. Default: 500.</p> <p>Increase this parameter when an application can't lock enough records and fails.</p> <p>Decrease this parameter if stations are using too many server resources.</p>
Maximum File Locks Per Connection = <i>number</i>	<p>Control how many opened and locked files a station can use at one time. (Use MONITOR to view how many opened and locked files a station is using.)</p> <p>Supported values: 10 to 1000. Default: 250.</p> <p>Increase this parameter when an application can't open enough files and fails.</p> <p>(An OS/2 station might need a higher default than 250. You may also need to increase the number of file handles in the station's NET.CFG file.)</p> <p>Decrease this parameter if stations are using too many server resources.</p>

Table 2-9 *continued*
Lock Parameters

Parameter	Use to
Maximum Record Locks = <i>number</i>	<p>Control how many record locks the operating system can handle. (Use MONITOR to view how many record locks a station is using on that server.)</p> <p>Supported values: 100 to 400000. Default: 20000.</p> <p>Increase this parameter if users have problems running applications and receive messages indicating that not enough record locks are available.</p> <p>Decrease this parameter if users are using too many server resources.</p>
Maximum File Locks = <i>number</i>	<p>Control how many opened and locked files the operating system can handle. (Use MONITOR to view the number of files that are open during peak usage.)</p> <p>Supported values: 100 to 100000. Default: 10000.</p> <p>Increase this parameter if the number of open files is near or equal to the default.</p> <p>Decrease this parameter to restrict the number of available server resources.</p>

Transaction Tracking Parameters

- ◆ A *transaction* is a set of write operations that must be completed together to maintain file and database integrity.
- ◆ *Write operations* consist not only of data and data records, but also of changes to the index and the key structures that are important to an application's continual operation.

- ◆ The Transaction Tracking System™ (TTS) guarantees that a transaction is written to disk in its complete form or is backed out if incomplete. This ensures database integrity in case a failure occurs before a transaction is completed.

See Table 2-10 for a description of transaction tracking parameters.

Table 2-10
Transaction Tracking Parameters

Parameter	Use to
Auto TTS Backout Flag = <i>value</i>	<p>Specify whether a crashed server with transactional files can automatically back out of incomplete transactions when the server is booted.</p> <p>Supported values:</p> <p>ON = The server backs out incomplete transactions when booting. OFF = The server waits for you to answer a prompt before it boots.</p> <p>Default: ON.</p> <p>You must set this parameter in STARTUP.NCF. You cannot set the parameter at the command line.</p>
TTS Abort Dump Flag = <i>value</i>	<p>Specify whether a file is created to log transactional backout data.</p> <p>Supported values:</p> <p>ON = The information is saved in TTS\$LOG.ERR. OFF = The information backed out is not saved.</p> <p>Default: OFF.</p> <p>When a server fails during a data write to a file flagged Transactional, the system can back out the incomplete write. The backed-out information is written to file TTS\$LOG.ERR on volume SYS:. You can print the file or view it with a text editor.</p>
Maximum Transactions = <i>number</i>	<p>Specify how many transactions can occur at the same time.</p> <p>Supported values: 100 to 10000. Default: 10000.</p>

Table 2-10 *continued***Transaction Tracking Parameters**

Parameter	Use to
TTS UnWritten Cache Wait Time = <i>time</i>	<p>Specify how long a block of transactional data can be held in memory.</p> <p>Supported values: 11 seconds to 10 minutes 59.1 seconds. Default: 1 minute 5.9 seconds.</p> <p>Some blocks of transactional data wait for other transactional blocks to be written first.</p> <p>If one of these blocks reaches its maximum time limit, other write requests are held up and this block is written to disk.</p>
TTS Backout File Truncation Wait Time = <i>time</i>	<p>Specify how long allocated blocks remain available for the TTS backout file when these blocks are not in use.</p> <p>Supported values: 1 minute 5.9 seconds to 1 day 2 hours 21 minutes 51.3 seconds. Default: 59 minutes 19.2 seconds.</p>

Disk Parameters

Disk parameters control one part of Hot Fix™ redirection. Hot Fix redirection can occur during a write request, a read request, or a read-after-write verification.

- ◆ Write redirection occurs when the disk reports an error during a write request. The system marks the block as bad and redirects the data to a different block.
- ◆ Read redirection occurs when a disk error happens during a read request.
If the disk is mirrored, the system retrieves the data from the mirrored disk and redirects the data on the primary disk. If the disk isn't mirrored, the data is lost, but the block is marked as bad.
- ◆ Read-after-write verify redirection occurs after data is written to disk. The data on disk is then read and compared to that in memory.

If the two don't match, the system marks the block as bad and redirects the data to a different block.

See Table 2-11 for a description of disk parameters.

Table 2-11
Disk Parameters

Parameter	Use to
Enable Disk Read After Write Verify = <i>value</i>	<p>Control whether information written to disk is compared with that in memory. Usually, you shouldn't disable this portion of Hot Fix.</p> <p>Supported values: ON, OFF. Default: ON.</p> <p>If your disks are mirrored and reliable and you need extra speed on disk writes, using OFF can almost double the speed of disk writes.</p> <p>Some disks and drivers provide their own read-after-write verify procedure. In this case, set the parameter to OFF, so the read-after-write-verify operation isn't done twice.</p> <p>Changing this value affects only disks loaded after the parameter is changed. To set this value for currently loaded disks, use the "Disk Information" option of the MONITOR utility. See "MONITOR" on page 141.</p> <p>This parameter can be set in the STARTUP.NCF file, if desired.</p>
Remirror Block Size = <i>value</i>	<p>Sets the remirror block size in 4 KB increments. (1=4 KB, 2=8 KB, 8=32 KB, etc.)</p> <p>Supported values: 1 to 8. Default: 1.</p>
Concurrent Remirror Requests = <i>value</i>	<p>Sets the number of remirror requests per logical partition.</p> <p>Supported values: 2 to 32. Default: 4.</p>

Table 2-11 *continued***Disk Parameters**

Parameter	Use to
Mirrored Devices Are Out of Sync Message Frequency = <i>time</i>	Sets the frequency (in minutes) for checking out-of-sync devices. Supported values: 5 to 9999 minutes. Default: 30 minutes. This parameter can be set in the STARTUP.NCF file, if desired.

Time Synchronization Parameters

Time parameters control time synchronization, the TIMESYNC.CFG file, and time zone settings to insure that the time reported by all servers is consistent, or synchronized. (See “Time synchronization” in *Concepts*.)

See Table 2-12 for a description of time parameters.

Table 2-12

Time Synchronization Parameters

Parameter	Use to
TIMESYNC ADD Time Source = <i>server name</i>	Specify a server as a time source. Use EDIT, rather than this parameter, to add a server to the time source list in the TIMESYNC.CFG file. Maximum: 48 characters.
TIMESYNC Configuration File = <i>path</i>	Specify the path where the TIMESYNC.CFG configuration file is located. Maximum: 255 characters. Example: SET TIMESYNC CONFIGURATION FILE = SYS:SYSTEM\TIMESYNC.CFG

Table 2-12 *continued*

Time Synchronization Parameters

Parameter	Use to
TIMESYNC Configured Sources = <i>value</i>	<p>Specify what time sources the server listens to.</p> <p>Supported values:</p> <p>ON = The server ignores SAP time sources and relies on time sources custom-configured with the TIMESYNC Time Source parameter.</p> <p>OFF = The server listens to any advertising time source.</p> <p>Default: OFF.</p>
TIMESYNC Directory Tree Mode = <i>value</i>	<p>Control the use of SAP packets in the Directory tree.</p> <p>Supported values:</p> <p>ON = Time synchronization ignores SAP packets that don't originate from within the Directory tree the server is on.</p> <p>OFF = The server can receive SAP packets from any time source on the network.</p> <p>Default: ON.</p> <p>Don't set this parameter to OFF if SAP is set to ON. Using OFF could corrupt the time synchronization for this server's Directory tree.</p>
TIMESYNC Hardware Clock = <i>value</i>	<p>Controls hardware clock synchronization.</p> <p>Supported values:</p> <p>ON = The Primary and Secondary time servers set the hardware clock, and the Single Reference and Reference Servers set their time from the hardware clock at the beginning of each polling interval.</p> <p>OFF = Use <i>only</i> if this server uses an external time source (such as a radio clock).</p> <p>Default: ON.</p>

Table 2-12 *continued***Time Synchronization Parameters**

Parameter	Use to
TIMESYNC Polling Count = <i>number</i>	Specify how many time packets to exchange while polling. Increasing the number of packets adds unnecessary traffic to the network. Supported values: 1 to 1000. Default: 3.
TIMESYNC Polling Interval = <i>number</i>	Specify the long polling interval, in seconds. Supported values: 10 to 2678400 seconds (31 days). Default: 600 seconds (10 minutes). All servers in the same tree must use the same setting.
TIMESYNC REMOVE Time Source = <i>server name</i>	Delete a server as a time source. Use EDIT, rather than this parameter, to delete a server from the time source list in the TIMESYNC.CFG file. Maximum: 48 characters.
TIMESYNC RESET = <i>value</i>	Reset time synchronization and clear the time source list. Use EDIT, rather than this parameter, to reset values in the TIMESYNC.CFG file and to remove the time source list from the file. Supported values: ON = Selected internal values are reset and the configured server list is cleared. Flag automatically resets to OFF. Default: OFF.
TIMESYNC Restart Flag = <i>value</i>	Control restarts of time synchronization. Supported values: ON, OFF. Default: OFF. Set this parameter to ON only if you want to reload TIMESYNC without rebooting the server.

Table 2-12 *continued***Time Synchronization Parameters**

Parameter	Use to
TIMESYNC Service Advertising = <i>value</i>	<p>Control time source advertising.</p> <p>Supported values:</p> <p>ON = The Single Reference, Reference, and Primary time source advertise using SAP.</p> <p>OFF = Use only if you are using a custom-configured list of time sources.</p> <p>Default: ON.</p> <p>Note: Secondary time services do not advertise.</p>
TIMESYNC Synchronization Radius = <i>number</i>	<p>Control the maximum time adjustment (in milliseconds) a server is allowed while still being considered synchronized.</p> <p>Supported values: 0 to 2147483647 milliseconds.</p> <p>Default: 2000.</p> <p>Increase this parameter to allow a wider margin of error for time synchronization between servers.</p> <p>Important: Lowering the synchronization radius increases the chance of servers losing synchronization due to randomness between clocks.</p> <p>Setting the synchronization radius for under 2000 milliseconds (2 seconds) is not recommended.</p> <p>Set the synchronization radius for under 2 seconds only if you are using an application that uses synchronized time stamps which do not tolerate a 2-second deviation between time sources.</p>

Table 2-12 *continued***Time Synchronization Parameters**

Parameter	Use to
<code>TIMESYNC Time Adjustment = [+ or -] hour:minute:second [at month/day/ year hour:minute:second AM or PM]</code>	<p>Specify when a time adjustment will take place.</p> <p>Note: You cannot use this parameter on a Secondary time server.</p> <p>Maximum: 99 characters.</p> <p>Default: None scheduled.</p> <p>Use this parameter sparingly to correct network-wide time errors.</p> <p>Default date and time is six polling intervals or 1 hour (whichever is longer) from the current time.</p> <p>Misuse of this parameter can corrupt time synchronization and the order of events on your network.</p>
<code>TIMESYNC Time Source: server name</code>	<p>Specify a server as time source. If no server name is entered, the parameter displays the list of configured servers.</p> <p>Use EDIT, rather than this parameter, to add a server to the configuration list in the TIMESYNC.CFG file.</p> <p>Maximum: 48 characters.</p>
<code>TIMESYNC Type = type of time source</code>	<p>Specify the default time source type.</p> <p>Use EDIT, rather than this parameter, to specify the default time source type in the TIMESYNC.CFG file.</p> <p>Supported types: Reference, Primary, Secondary, Single Reference..</p> <p>Maximum: 23 characters.</p> <p>Default: Single Reference.</p>
<code>TIMESYNC Write Parameters = value</code>	<p>Specify whether parameters specified by the "TIMESYNC Write Value" parameter are written to the configuration file.</p> <p>Supported values: ON, OFF.</p> <p>Default: OFF.</p>

Table 2-12 *continued*

Time Synchronization Parameters

Parameter	Use to
TIMESYNC Write Value = <i>number</i>	Control which parameters are written by “TIMESYNC Write Parameters.”
	Supported values:
	1 = Write internal parameters only. 2 = Write configured time sources only. 3 = Write both parameters and configured time sources.
	Default: 3
Time Zone = <i>time zone string</i>	Specifies the time zone string, which indicates:
	◆ The abbreviated time zone name. ◆ The offset from Universal Time (UTC). ◆ The alternate abbreviated time zone name to be used when daylight saving time is in effect.
	Maximum: 80 characters. Default: No Time Zone.
	This parameter causes UTC time to be recalculated from local time.
	This parameter can be set in the STARTUP.NCF file, if desired.
Default Time Server Type = <i>type of time source</i>	Specify the default time synchronization server type. This parameter can be overridden by other time synchronization parameters.
	Supported types: Reference, Primary, Secondary, Single Reference.
	Maximum: 50. Default: Secondary.
	This parameter can be set in the STARTUP.NCF file, if desired.

Table 2-12 *continued***Time Synchronization Parameters**

Parameter	Use to
Start of Daylight Savings Time = <i>date and time</i>	Specify the local date and time when the change to daylight saving time should occur. Maximum: 79 characters. Important: You must set both the start and end of daylight saving time before either date is actually scheduled.
End of Daylight Savings Time = <i>date and time</i>	Specify the local date and time when the change from daylight saving time should occur. Maximum: 79 characters. Important: You must set both the start and the end of daylight saving time before either date is actually scheduled.
Daylight Savings Time Offset = [+ or -] <i>hour:minute:second</i>	Control the offset applied to time calculations when daylight saving time is in effect. Default: +1:00:00. This parameter causes UTC time to be recalculated from local time. This parameter can be set in the STARTUP.NCF file, if desired.
Daylight Savings Time Status = <i>value</i>	Indicate whether daylight saving time is in effect. Supported values: ON, OFF. Default: OFF. If this parameter is set to ON, you should also use the Daylight Savings Time Offset parameter. Changing the daylight saving time status does not change the local time. This parameter can be set in the STARTUP.NCF file, if desired.

Table 2-12 *continued***Time Synchronization Parameters**

Parameter	Use to
New Time With Daylight Savings Time Status = <i>value</i>	Control the adjustment of local time when daylight saving time is in effect. Supported values: ON, OFF. Default: OFF. ON = Adjust the local time by adding or subtracting the Daylight Saving Time Offset parameter.

NCP Parameters

With NetWare Core Protocol™ (NCP) parameters, you can

- ◆ Control NCP™ packets
- ◆ Control boundary checking
- ◆ Assign the NCP Server Packet Signature levels

See Table 2-13 for a description of NCP parameters.

Table 2-13
NCP Parameters

Parameter	Use to
NCP File Commit = <i>value</i>	<p>Control whether applications can flush pending file writes to disk.</p> <p>Supported values: ON, OFF. Default: ON.</p> <p>If the value is set to ON then when a “File Commit NCP” is issued, a file is sent from cache to disk immediately, instead of waiting for the cache manager to send it to disk later.</p>
Display NCP Bad Component Warnings = <i>value</i>	<p>Control whether NCP bad component alert messages are displayed.</p> <p>Supported values: ON, OFF. Default: OFF.</p> <p>This parameter can be set in the STARTUP.NCF file, if desired.</p>
Reject NCP Packets with Bad Components = <i>value</i>	<p>Specify whether NCP packets that fail component checking are rejected.</p> <p>Supported values: ON, OFF. Default: OFF.</p> <p>This parameter can be set in the STARTUP.NCF file, if desired.</p>
Display NCP Bad Length Warnings = <i>value</i>	<p>Control whether NCP bad length alert messages are displayed.</p> <p>Supported values: ON, OFF. Default: OFF.</p> <p>This parameter can be set in the STARTUP.NCF file, if desired.</p>
Reject NCP Packets with Bad Lengths = <i>value</i>	<p>Specify whether NCP packets that fail boundary checking are rejected. This parameter can be used as a debugging tool.</p> <p>Supported values: ON, OFF. Default: OFF.</p> <p>This parameter can be set in the STARTUP.NCF file, if desired.</p>

Table 2-13 continued
NCP Parameters

Parameter	Use to
Maximum Outstanding NCP Searches = <i>number</i>	<p>Specify the maximum number of NCP directory searches that can be processed simultaneously.</p> <p>Supported values: 10 to 1000. Default: 51.</p> <p>Normally, only one NCP directory search occurs at a time.</p> <p>Increase the default only if you use applications that support multiple outstanding directory search operations <i>and</i> you have problems with corrupted or invalid directory information.</p>
NCP Packet Signature Option = <i>number</i>	<p>Control the NCP packet signature level on the server.</p> <p>Supported values:</p> <p>0 = Server doesn't sign packets (regardless of the client level).</p> <p>1 = Server signs packets only if the client requests it (client level is 2 or higher).</p> <p>2 = Server signs packets if the client is capable of signing (client level is 1 or higher).</p> <p>3 = Server signs packets and requires all clients to sign packets (or logging in will fail).</p> <p>Default: 1.</p> <p>NCP Packet Signature prevents packet forgery on servers and clients using NCP by requiring server and client to "sign" each NCP packet.</p> <p>Note: Because Packet Signature consumes CPU resources and slows performance on both client and server, NCP Packet Signature is optional.</p> <p>This parameter can be set in the STARTUP.NCF file, if desired.</p>

Table 2-13 continued
NCP Parameters

Parameter	Use to
Enable IPX Checksums = <i>number</i>	<p>Specify the enabling of IPX checksums.</p> <p>Supported values:</p> <p>0 = For no checksums. 1 = To checksum if enabled at the client. 2 = To require checksums.</p> <p>Default: 1.</p> <p>This parameter can be set in the STARTUP.NCF file, if desired.</p>
Allow Change to Client Rights = <i>value</i>	<p>Control whether a job server can assume the rights of a client for NCP packet signatures.</p> <p>Supported values: ON, OFF. Default: ON.</p> <p>Note: Some job servers and third-party applications can't function without changing to client rights.</p> <p>Using OFF may prevent some job servers from getting access to the files they need, but it prevents the forging of a packet through the job or print server.</p> <p>This parameter can be set in the STARTUP.NCF file, if desired.</p>
Allow LIP = <i>value</i>	<p>Set Large Internet Packet (LIP) support.</p> <p>Supported values: ON, OFF. Default: ON.</p> <p>This parameter can be set in the STARTUP.NCF file, if desired.</p>

Miscellaneous Parameters

These parameters include various alert settings, as well as other miscellaneous parameters.

See the parameter descriptions in Table 2-14..

Table 2-14
Miscellaneous Parameters

Parameter	Use to
Sound Bell for Alerts = <i>value</i>	Control whether a bell sounds when an alert message appears on the console. Supported values: ON, OFF. Default: ON.
Replace Console Prompt with Server Name = <i>value</i>	Control whether the console prompt is replaced with the NetWare server name. Supported values: ON, OFF. Default: ON. This parameter can be set in the STARTUP.NCF file, if desired.
Alert Message Nodes = <i>number</i>	Specify the number of alert message nodes that have been previously allocated. Supported values: 10 to 256. Default: 20. This parameter can be set in the STARTUP.NCF file, if desired.
Worker Thread Execute In a Row Count = <i>number</i>	Specify the number of times the scheduler consecutively dispatches new work before allowing other threads to run. Supported values: 1 to 20. Default: 10.

Table 2-14 *continued***Miscellaneous Parameters**

Parameter	Use to
Halt System on Invalid Parameters = <i>value</i>	<p>Specify whether to stop the system when invalid parameters are detected.</p> <p>Supported values:</p> <p>ON = You want the system to halt when an invalid parameter or condition is detected.</p> <p>OFF = You want the system to display an alert and continue running when an invalid parameter or condition is detected.</p> <p>Default: OFF.</p> <p>This parameter can be set in the STARTUP.NCF file, if desired.</p>
Upgrade Low Priority Threads = <i>value</i>	<p>Specify whether low-priority threads are scheduled at regular priority.</p> <p>Some modules can freeze up low-priority threads, causing file compression to shut down and other problems.</p> <p>Supported values: ON, OFF.</p> <p>Default: OFF.</p>
Display Relinquish Control Alerts = <i>value</i>	<p>Control whether messages about CPU control are sent to the server console. This parameter can be used as a debugging tool.</p> <p>Supported values:</p> <p>ON = Use if you're writing your own loadable modules.</p> <p>OFF = Use if you're not writing your own loadable modules.</p> <p>Default: OFF.</p> <p>If a module uses the processor for more than 0.4 second without relinquishing control to other processes, the following types of messages appear:</p> <p><i><process name></i> Process did not relinquish control frequently. <i>Module: <module name></i> <i>Code offset in module: <memory address></i></p> <p>This parameter can be set in the STARTUP.NCF file, if desired.</p>

Table 2-14 *continued*
Miscellaneous Parameters

Parameter	Use to
Display Incomplete IPX Packet Alerts = <i>value</i>	<p>Specify whether alert messages are displayed when IPX receives incomplete packets. This parameter can be used as a debugging tool.</p> <p>Supported values: ON, OFF. Default: ON.</p> <p>This parameter can be set in the STARTUP.NCF file, if desired.</p>
Display Old API Names = <i>value</i>	<p>Control messages about NetWare 3 API calls. This parameter can be used as a debugging tool.</p> <p>Supported values:</p> <p>ON = Use if you write your own modules and you are upgrading NetWare 3.0 modules to modules using newer APIs.</p> <p>OFF = Use if you aren't upgrading modules.</p> <p>Default: OFF</p> <p>The following types of messages appear when a module is loaded that uses the old APIs:</p> <p>Module is using old API: SetInterruptVector Module is using old API: ReturnPermanentMemory Module is using old API: AllocateReturnablePermMemory</p> <p>The old APIs work, but more slowly than the new APIs. If you receive these messages, contact the vendor of the module.</p> <p>This parameter can be set in the STARTUP.NCF file, if desired.</p>
Developer Option = <i>value</i>	<p>Control whether options associated with a developer environment are enabled.</p> <p>Supported values: ON, OFF. Default: OFF.</p> <p>This parameter can be set in the STARTUP.NCF file, if desired.</p>

Table 2-14 *continued***Miscellaneous Parameters**

Parameter	Use to
Display Spurious Interrupt Alerts = <i>value</i>	<p>Control alert messages about spurious interrupts.</p> <p>Supported values: ON, OFF. Default: ON.</p> <p>A spurious interrupt occurs when hardware in the server creates an interrupt that is defined and reserved for another device.</p> <p>Spurious interrupts generate the following message: Spurious hardware interrupt <number> detected.</p> <p>This message indicates a serious error in the hardware.</p> <p>If your server console displays this message, remove all add-on boards and run SERVER.</p> <p>If the message doesn't appear, add the boards one at a time to determine the hardware creating the spurious interrupt. Then contact the vendor.</p> <p>Set the parameter to OFF while you are waiting for a resolution.</p> <p>This parameter can be set in the STARTUP.NCF file, if desired.</p>

Table 2-14 *continued***Miscellaneous Parameters**

Parameter	Use to
Display Lost Interrupt Alerts = <i>value</i>	<p>Control alert messages about lost interrupts.</p> <p>Supported values: ON, OFF. Default: ON.</p> <p>A lost interrupt occurs when a driver or board requests a service with an interrupt call and then drops the request before the CPU can respond.</p> <p>Lost interrupts generate the following message: Interrupt controller detected a lost hardware interrupt.</p> <p>This message indicates a hardware or driver problem that could degrade performance.</p> <p>Unload all drivers and then reload them one at a time to determine which driver has a problem. Then contact the vendor of the driver.</p> <p>Set the parameter to OFF while you are waiting for a resolution.</p> <p>You can set this parameter in the STARTUP.NCF file.</p>
Pseudo Preemption Count = <i>number</i>	<p>Specify the number of times threads are allowed to make file read or write system calls before a relinquish is forced.</p> <p>Supported values: 1 to 4294967295. Default: 10.</p>
Global Pseudo Preemption = <i>value</i>	<p>Specify whether or not all threads use pseudo preemption.</p> <p>Supported values: ON, OFF. Default: OFF</p>

Table 2-14 *continued*
Miscellaneous Parameters

Parameter	Use to
Maximum Service Processes = <i>number</i>	<p>Specify the maximum number of service processes that the operating system can create. (View the number of service processes in MONITOR.)</p> <p>Supported values: 5 to 100. Default: 40.</p> <p>Decrease this parameter temporarily if the server is low on memory. If the server is always low on memory, add memory.</p> <p>Increase this parameter if the number of service processes is at the maximum.</p> <p>Increasing this number helps only if more than 20 requests are being delayed simultaneously for a disk I/O to be completed.</p>
New Service Process Wait Time = <i>number</i>	<p>Specify how long the system should wait to make an allocation when it receives a request for another service process.</p> <p>Supported values: 0.3 second to 20 seconds. Default: 2.2 seconds.</p>
Automatically Repair Bad Volumes = <i>value</i>	<p>Specify whether VREPAIR runs automatically on a volume that fails to mount.</p> <p>Supported values: ON, OFF. Default: ON.</p> <p>You can set this parameter in the STARTUP.NCF file.</p>

Table 2-14 *continued*
Miscellaneous Parameters

Parameter	Use to
Allow Unencrypted Passwords = <i>value</i>	<p>Control the use of unencrypted passwords. If your servers run NetWare 3.1x, use OFF.</p> <p>Supported values: ON, OFF. Default: OFF.</p> <p>If your servers run versions of NetWare earlier than NetWare 3.0 and you leave the parameter set to OFF, your users might have problems logging in.</p> <p>If you have servers that run NetWare 2.12 and later, copy the NetWare 3.1x utilities to those servers and set this parameter to OFF.</p> <p>If you don't copy NetWare 3.1x utilities to NetWare 2 servers, use ON.</p>

Error Handling Parameters

Error handling parameters control the size of error logs and what happens when logs exceed the specified size.

See Table 2-15 for descriptions of error handling parameters.

Table 2-15
Error Handling Parameters

Parameter	Use to
Server Log File State = <i>number</i>	<p>Control what happens when the SYS\$LOG.ERR file is larger than the size specified by the Server Log File Overflow Size parameter.</p> <p>Supported values:</p> <p>0 = Use to leave SYS\$LOG.ERR as is. 1 = Use to delete SYS\$LOG.ERR. 2 = Use to rename SYS\$ERR.LOG.</p> <p>Default: 1</p> <p>You can set this parameter in the STARTUP.NCF file.</p>
Volume Log File State = <i>number</i>	<p>Control what happens when the VOL\$LOG.ERR file is larger than the size specified by the Volume Log File Overflow Size parameter.</p> <p>Supported values:</p> <p>0 = Use to leave VOL\$LOG.ERR as is. 1 = Use to delete VOL\$LOG.ERR. 2 = Use to rename VOL\$ERR.LOG.</p> <p>Default: 1.</p> <p>You can set this parameter in the STARTUP.NCF file.</p>

Table 2-15 continued
Error Handling Parameters

Parameter	Use to
Volume TTS Log File State = <i>number</i>	Control what happens when the TTS\$LOG.ERR file is larger than the size specified by the "Volume TTS Log File Overflow Size" parameter. Supported values: 0 = Use to leave TTS\$LOG.ERR as is. 1 = Use to delete TTS\$LOG.ERR. 2 = Use to rename TTS\$ERR.LOG. Default: 1. You can set this parameter in the STARTUP.NCF file.
Server Log File Overflow Size = <i>number</i>	Specify the maximum size of the SYS\$LOG.ERR file before the action specified by the Server Log File State parameter occurs. Supported values: 65536 to 4294967295. Default: 4194304. You can set this parameter in STARTUP.NCF.
Volume Log File Overflow Size = <i>number</i>	Specify the maximum size of the VOL\$LOG.ERR file before the action specified by the Volume Log File State parameter occurs. Supported values: 65536 to 4294967295. Default: 4194304. You can set this parameter in the STARTUP.NCF file.
Volume TTS Log File Overflow Size = <i>number</i>	Specify the maximum size of the TTS\$LOG.ERR file before the action specified by the Volume TTS Log File State parameter occurs. Supported values: 65536 to 4294967295. Default: 4194304. You can set this parameter in the STARTUP.NCF file.

NetWare Directory Services Parameters

NetWare Directory Services (NDS) parameters allow you to do the following:

- ◆ Control the NDS trace file.
- ◆ Set time intervals for maintenance processes that reclaim disk space, remove external references, and check the consistency of backlinks.
- ◆ Set NDS synchronization intervals and restrictions.
- ◆ Specify the number of NCP retries before timeout.
- ◆ Mark the status of other servers in the namebase as UP or DOWN.
- ◆ Specify bindery services contexts.

Table 2-16
NetWare Directory Services Parameters

Parameter	Use to
NDS Trace to Screen = ON/OFF	Enable the NDS trace screen; this displays information about NDS events on the monitor. Supported values: ON, OFF. Default: OFF.
NDS Trace to File = ON/OFF	Send messages about NDS events to the NDS trace file on the SYS: volume. The default file is SYSTEM\DSTRACE.DBG. Supported values: ON, OFF. Default: OFF. The file path and name can be changed with the NDS Trace Filename parameter. The file is circular; it grows to a maximum length of approximately 500 KB and then starts to overwrite itself at the beginning of the file. If this parameter is set to ON, the trace information is also scrolled on the screen.
NDS Trace Filename = <i>path\name</i>	Set the path and name of the NDS trace file on SYS: volume. Maximum length: 255. Default: SYSTEM\DSTRACE.DBG.
NDS Client NCP Retries = <i>number</i>	Specify the number of NCP retries before the NDS client times out a connection. Supported values: 1 to 20. Default: 3. Lower settings are useful for smaller networks or those in which cables are disconnected frequently. Higher settings are useful for larger networks with heavy traffic. A setting of 4, 5, or 6 should be sufficient for large networks.

Table 2-16 *continued***NetWare Directory Services Parameters**

Parameter	Use to
NDS External Reference Life Span = <i>number in hours</i>	<p>Specify the number of hours unused external references are allowed to exist before being removed.</p> <p>Supported values: 1 to 384 hours. Default: 192.</p> <p>External references are local IDs assigned to users when they access other servers. When users no longer have access, the external references should be removed.</p>
NDS Synchronization Interval = <i>number in minutes</i>	<p>Specify the maximum elapsed time between exhaustive synchronization checks. As soon as you change this value, the system executes the synchronization check. Synchronization checks then recur at the specified interval.</p> <p>Supported values: 2 to 1440 minutes. Default: 30.</p> <p>If the system has replicas across a WAN link, this value should be set as high as 240 minutes (4 hours) to reduce WAN traffic.</p>
NDS Synchronization Restrictions = OFF/ON, <i>version number list</i>	<p>Specify which versions of NetWare Directory Services the server can synchronize with.</p> <p>Supported values: OFF, ON, <i>list of version numbers</i>. Maximum length of version number list: 132 characters.</p> <p>Default: OFF.</p> <p>To determine what version is currently loaded on a server, type MODULES at the server prompt. The NetWare Directory Services version number is displayed under the heading "DS.NLM."</p> <p>If this parameter is set to OFF, the server synchronizes with all versions available.</p> <p>If this parameter is set to ON, the server synchronizes only with those versions specified as parameters to the ON value.</p> <p>Example: ON,420,421</p>

Table 2-16 *continued*

NetWare Directory Services Parameters

Parameter	Use to
NDS Servers Status = <i>value</i>	<p>Mark the status of all server objects in the local namebase as UP or DOWN.</p> <p>Supported values: UP, DOWN</p> <p>Use this parameter to reset the status of all the servers if the status of one server isn't accurately recognized by the system.</p> <p>For example, if a server is up but the system recognizes it as down, set this parameter to mark all servers as up.</p> <p>Subsequently, the system would reassess the status of all servers and change the status to down for those servers that were truly down.</p>
NDS Janitor Interval = <i>number in minutes</i>	<p>Set the interval in minutes at which the janitor process is executed. The janitor process is executed as soon as you change this value and then recurs at the specified interval.</p> <p>Supported values: 1 to 10080 minutes. Default: 60.</p> <p>The janitor process cleans up unused records, reclaims disk space, and purges objects flagged for deletion.</p>
NDS Backlink Interval = <i>number in minutes</i>	<p>Set the interval in minutes at which backlink consistency checking is performed. Backlink consistency checking is executed as soon as you change this value. It then recurs at the specified interval.</p> <p>Supported values: 2 to 10080 minutes. Default: 780.</p> <p>A backlink indicates that an object in a replica has an ID on a server where the replica doesn't exist.</p> <p>This process creates needed backlinks and deletes unnecessary ones.</p>

Table 2-16 *continued***NetWare Directory Services Parameters**

Parameter	Use to
NDS Trace File Length to Zero = ON	<p>Delete the contents of the trace file. This parameter does not delete the file itself. As soon as the file is cleared, the parameter resets to OFF.</p> <p>Supported values: ON, OFF. Default: OFF.</p> <p>To use this parameter, you must also set the NDS trace to file parameter to ON, because the trace file must be open for the system to delete its contents.</p>
Bindery Context = <i>context;context</i>	<p>Specify one or more containers to be used by NetWare Directory Services when it provides bindery services.</p> <p>Maximum: 256 characters. Up to 16 contexts.</p> <p>Multiple contexts are separated by semicolons. To set multiple contexts, you must have a replica of the container you specify in the context on the same partition.</p> <p>Example: SET BINDERY CONTEXT = OU=SALES_LA.OU=SALES.O=NOVELL_US;OU=ACCOUNTING.O=NOVELL</p> <p>This parameter can be set in the STARTUP.NCF file.</p>

SFT III Parameters

A NetWare 4.1 SFT III™ system provides additional SET parameters to help you test and customize your mirrored server environment.

Some SET parameters affect only one engine (the MSEngine or the IOEngine). A few parameters can be set in both engines (see "SFT III Parameters Settable in Both Engines" on page 361).

You must execute SET parameters in the correct engine. To toggle to the appropriate console display (IOEngine or MSEngine), use the **<Alt>+<Esc>** keys before typing a SET command.

The NetWare 4.1 SET parameters listed in previous sections can also be used with a NetWare SFT III system.



Note Changing one SFT III SET parameter may affect other parameters. As a general rule, don't change more than one parameter at a time.

MSEngine Parameters Only Settable at Startup

The following MSEngine SET parameters are settable only at startup:

- Minimum Packet Receive Buffers
- Cache Buffer Size
- Maximum Subdirectory Tree Depth
- Auto TTS Backout Flag
- Concurrent Remirror Requests

To change the default for these parameters, put the SET parameter in the MSSTART.NCF file.



Note If you change the Minimum Packet Receive Buffers parameter in the MSSTART.NCF file, you must also put the same SET parameter in the IOSTART.NCF file.

Changes to the MSSTART.NCF file do not take effect until after you bring down both servers and reactivate them.

IOEngine Parameters Only Settable at Startup

The following IOEngine SET parameters are settable only at startup:

- Maximum Physical Receive Packet Size
- Minimum Packet Receive Buffers
- Auto Register Memory Above 16 Megabytes

To change the default for these parameters, include the SET parameter in the IOSTART.NCF file and restart that server.

SFT III Parameters Settable in Both Engines

The following parameters can be set in either the IOEngine or the MSEngine, or both engines. In most cases, the parameter setting in the IOEngine and the MSEngine should match.

- Maximum Packet Receive Buffers
- Minimum Packet Receive Buffers
- Allow Invalid Pointers
- Read Fault Notification
- Read Fault Emulation
- Write Fault Notification
- Write Fault Emulation
- Sound Bell for Alerts
- Replace Console Prompt With Server Name
- Alert Message Nodes
- Worker Thread Execute in a Row Count
- Halt System on Invalid Parameters
- Upgrade Low Priority Threads
- Display Relinquish Control Alerts
- Display Incomplete IPX Packet Alerts
- Display Old API Names

Related SFT III “Wait Time” Parameters

Five SFT III SET parameters are closely related:

MSL Error Wait Time (default: 0.8 second)

Secondary Take Over Wait Time (default: 1 second)

IPX Internet Down Wait Time (default: 4 seconds)

MSL Deadlock Wait Time (default: 5 seconds)

Check LAN Extra Wait Time (default: 0 seconds + 5 seconds)

Because their wait time settings affect server switchover, you should understand the interrelationships of these parameters before you change any of their default settings.

- ◆ Of the related wait time values, the MSL Error Wait Time should be the shortest. It should be shorter by 1 second than the Secondary Take Over Wait Time.
- ◆ Both the MSL Error Wait Time and the Secondary Take Over Wait Time should be shorter than the IPX Internet Down Wait Time.
- ◆ For hardware failures, you need to find out if the Mirrored Server Link™ (MSL) is down (so the secondary server can shut down) before you start checking the LAN hardware. Therefore, the MSL Error Wait Time also should be shorter than the Check LAN Extra Wait Time.
- ◆ For software failures, you need to find out if the LAN is down before you find out if the MSL is down. Otherwise, both servers could fail at the same time. Therefore, the IPX Internet Down Wait Time should be shorter than the MSL Deadlock Wait Time.

Parameter Descriptions

SFT III SET Parameters are described in the following tables:

Table 2-17, "MSEngine Communication Parameters (SFT III)"
(page 363)

Table 2-18, "MSEngine Miscellaneous Parameters (SFT III)" (page 364)

Table 2-19, "IOEngine Communication Parameters (SFT III)" (page 365)

Table 2-20, "IOEngine Memory Parameters (SFT III)" (page 366)

Table 2-21, "IOEngine Mirrored Server Parameters (SFT III)" (page 367)

Table 2-22, "IOEngine Mirrored Servers Error Recovery Options
Parameters (SFT III)" (page 373)

Table 2-23, "IOEngine Mirrored Servers Test Options Parameters
(SFT III)" (page 377)

Table 2-24, "IOEngine Error Handling Parameters (SFT III)" (page 379)

Table 2-17

MSEngine Communication Parameters (SFT III)

Parameter	Use to
Clear Extra ECB Space = <i>number</i>	<p>Specify whether to fill the leftover space in a receive event control block (ECB) with zeroes to prevent abends caused by undersized packets.</p> <p>Supported values: 0 to 2. Default: 1.</p> <p>0 = Don't fill the leftover space in the ECB with zeroes. 1 = Fill up to 64 extra bytes in the ECB with zeroes. 2 = Fill the rest of the ECB with zeroes.</p> <p>To improve server performance, set this parameter to 0. To prevent recurring "MSEngine outputs different" errors, set it to 2.</p>

Table 2-18
MSEngine Miscellaneous Parameters (SFT III)

Parameter	Use to
Notify All Users Of Mirrored Server Synchronization = <i>value</i>	<p>Specify whether to broadcast a message to all logged-in users when the mirrored servers begin synchronizing. If the server has more than 64 MB of RAM, or if server synchronization takes more than 5 seconds, set this parameter to ON.</p> <p>Supported values: ON, OFF Default: OFF.</p>
Server Failure Notification Name = <i>name</i>	<p>Specify the user or group name to notify with a broadcast message in case of a server or disk failure or disk-out-of-sync condition. To send the broadcast to all logged-in users, use group EVERYONE.</p> <p>Note: If you use an invalid user or group name, the broadcast message will fail.</p> <p>Supported values: any valid user or group name. Default: no group or user name.</p>
MSEngine Use Primary Server For DOS I/O = <i>value</i>	<p>Specify which server to use for DOS input to the MSEngine. To copy data from the secondary server's DOS partition or floppy drive, set this parameter to OFF.</p> <p>Supported values: ON, OFF. Default: ON.</p>

Table 2-19
IOEngine Communication Parameters (SFT III)

Parameter	Use to
Check LAN Option = <i>number</i>	<p>Check the functionality of the LAN boards in the server and prevent loss of service to clients by providing early warning of LAN board problems.</p> <p>Supported values: 0 to 2.</p> <p>0 = Don't check the server LAN boards.</p> <p>1 = If a LAN board problem is detected, notify the server console but don't restart the primary server.</p> <p>2 = If the secondary server's LAN boards are more functional, restart the primary server.</p> <p>Default: 2.</p> <p>Note: The secondary server uses the same value for this parameter as the primary server.</p>
Check LAN Extra Wait Time = <i>time</i>	<p>Specify the additional time the server waits (5 seconds plus the value of this parameter) before taking the action specified in the Check LAN Option parameter. If traffic is heavy on your network, or if MAUs need more time to reset, increase this setting.</p> <p>Supported values: 0 seconds to 59.3 seconds.</p> <p>Default: 0.</p>
Use Diagnostic Responder to Validate LAN Functionality = <i>value</i>	<p>Specify whether to broadcast an IPX diagnostic request to verify that LAN boards are functional. If the SFT server is running standalone, or if the system isn't detecting bad boards, set this parameter to ON.</p> <p>Supported values: ON, OFF.</p> <p>If you have a router that replicates broadcast, don't set this parameter to ON or a flood of network traffic will result.</p> <p>If your SFT III server is the only server on the network, set this parameter to ON.</p> <p>Default: OFF.</p>

Table 2-20
IOEngine Memory Parameters (SFT III)

Parameter	Use to
Borrow Short Term Memory Ahead Amount = <i>number</i>	<p>Specify the amount of memory the system keeps available for processes that temporarily need extra memory.</p> <p>If you get an “insufficient short-term memory” error while running a module, set this parameter to a higher value and reload the module.</p> <p>Supported values: 0 to 100000 bytes. Default: 32768 bytes.</p>

Table 2-21
IOEngine Mirrored Server Parameters (SFT III)

Parameter	Use to
Secondary Take Over Wait Time= <i>time</i>	<p>Specify the number of seconds that the secondary server waits for an “I’m alive” packet from the primary server before taking over as the new primary server. (For more information, see “I’m Alive” Packet” in <i>Concepts</i>.)</p> <p>Supported values: 0.5 second to 20 seconds. Default: 1 second.</p> <p>Set this time to be longer than the MSL Error Wait Time. (For more about related SET parameters, see “Related SFT III “Wait Time” Parameters” on page 362.)</p> <p>If your network is connected to a busy internetwork and packets take longer to travel across it, increase the value of this parameter.</p> <p>Important: If the message “This server should not have become the primary server because the primary server is still alive” appears, increase the Secondary Take Over Wait Time by 0.5 second or more.</p> <p>However, setting this parameter too high may cause workstations to time out while the servers are determining if a switchover is needed.</p>
Display Mirrored Server Too Many Hops Away Message= <i>value</i>	<p>Specify whether to display a warning message if the hops between the mirrored servers exceed the Maximum Pseudo Hop Count parameter.</p> <p>Supported values: ON, OFF. Default: ON.</p> <p>If your SFT III servers are installed on the same network segment, set this parameter to OFF.</p>

Table 2-21 *continued*

IOEngine Mirrored Server Parameters (SFT III)

Parameter	Use to
Maximum Pseudo Hop Count= <i>number</i>	<p>Specify the maximum number of hops that the primary server will advertise as its pseudo hop count. (For more information, see "Pseudo hop count" in <i>Concepts</i>.)</p> <p>Supported values: 1 to 8. Default: 4.</p> <p>If your SFT III servers are installed on different network segments, with several hops between them, you may need to specify a higher Maximum Pseudo Hop Count.</p> <p>Important: Increasing the pseudo hop count reduces the number of hops available to stations on the internetwork.</p> <p>The total hop count (the pseudo hop count plus the actual number of hops from the router to the MSEngine) between a station and server cannot exceed 16.</p> <p>If the actual number of hops between mirrored servers is greater than the value specified by this parameter, the primary server advertises only the Maximum Pseudo Hop Count.</p>
Enable Pseudo Hop Count= <i>value</i>	<p>Specify whether the primary server advertises an artificially high hop count when it is mirrored to a secondary server on a different network segment. (For more information, see "Pseudo hop count" in <i>Concepts</i>.)</p> <p>Supported values: ON, OFF. Default: ON.</p> <p>If your SFT III servers are installed on the same network segment, set this parameter to OFF.</p>

Table 2-21 *continued***IOEngine Mirrored Server Parameters (SFT III)**

Parameter	Use to
New End Address For Unclaimed Memory Block= <i>number</i>	<p>Define the end of the MSEngine's memory range. The IOEngine claims any memory blocks numbered after the New End Address.</p> <p>If your servers have unequal amounts of RAM, use this parameter to align the memory of the larger-RAM server with the memory of the smaller-RAM server. (See "Responding to "Secondary Server is Missing RAM" Messages" in <i>Supervising the Network</i>.)</p> <p>Note: Reducing the MSEngine's memory too much (by setting a low New End Address number) might prevent volumes from mounting.</p> <p>Supported values: 2097152 to 1073741824 bytes. Default: highest memory installed in the server.</p>
New Start Address For Unclaimed Memory Block= <i>number</i>	<p>Define the start of the MSEngine's memory range. The IOEngine claims any memory blocks that fall before the New Start Address.</p> <p>Supported values: 2097152 to 1073741824 bytes. Default: 2097152 bytes.</p> <p>If the IOEngine is frequently borrowing memory from the MSEngine, set the New Start Address to a higher number to give the IOEngine more memory.</p>
MSL Error Wait Time= <i>time</i>	<p>Specify the number of seconds that the MSL driver waits for an acknowledgment of a sent packet before signaling that the other server or the MSL has failed.</p> <p>Supported values: 0.2 second to 4.4 seconds. Default: 0.8 second.</p> <p>If your servers are very busy (CPU utilization over 60%), use this parameter to give them more time to communicate. The value of this parameter should be less than the Secondary Take Over Wait Time parameter.</p> <p>Note: Changing the default on this parameter makes it take longer to determine that the other server has failed.</p>

Table 2-21 *continued***IOEngine Mirrored Server Parameters (SFT III)**

Parameter	Use to
Comprehensive MSEngine Synchronization Check= <i>value</i>	<p>Specify whether to do a comprehensive verification that both MSEngine outputs are the same.</p> <p>Supported values: ON, OFF. Default: OFF.</p> <p>Note: The OFF setting provides a faster, simpler check of MSEngine outputs. Though it reduces synchronization time, the OFF setting may increase the risk of undetected synchronization errors.</p>
IPX Internet Down Wait Time= <i>time</i>	<p>Specify how many seconds the server waits before concluding that the IPX internetwork is not delivering packets.</p> <p>Supported values: 0.5 second to 59.3 seconds. Default: 4 seconds.</p> <p>If you have a busy network or hardware reliability problems, use this parameter to allow more time for the server to get IPX packets.</p> <p>The value of this parameter should be more than the Secondary Take Over Wait Time, but less than the MSL Deadlock Wait Time.</p>
Display IPX Route to Other Server= <i>value</i>	<p>Specify whether to display the IPX route to the other server. This parameter is useful for troubleshooting internetwork problems.</p> <p>Supported values: ON, OFF. Default: OFF.</p> <p>The IPX route can show how efficient the network routing is by displaying the node numbers, the addresses, and the number of hops to the other server.</p>

Table 2-21 *continued***IOEngine Mirrored Server Parameters (SFT III)**

Parameter	Use to
MSL Deadlock Wait Time= <i>time</i>	<p>Specify how many seconds the server waits before concluding that the MSL driver is deadlocked (receive packets are being held off indefinitely).</p> <p>Supported values: 1 second to 59.3 seconds. Default: 5 seconds.</p> <p>If you have very busy servers, use this parameter to allow more time for the two servers to communicate. This setting times 4 is the time-out value that determines when the server exercises the MSL Send Blocked Recovery Option.</p> <p>Note: If you increase the IPX Internet Down Wait Time, you must also increase the MSL Deadlock Wait Time. Otherwise, if the MSL is deadlocked, the IPX connection may time out before the deadlock is detected.</p> <p>It is best if the MSL Deadlock Wait Time is at least one second longer than the IPX Internet Down Wait Time.</p>
Extra MSL Checking= <i>value</i>	<p>Specify whether to do extra checking of MSL messages to ensure data integrity.</p> <p>Supported values: ON, OFF. Default: ON.</p> <p>Note: Setting this parameter to OFF may improve performance, but it increases the risk of undetected MSL errors.</p>
IOEngine Error Log Use DOS= <i>value</i>	<p>Specify whether to log system alerts to the default DOS drive if volume SYS: is not mounted.</p> <p>Supported values: ON, OFF. Default: ON.</p> <p>When the servers are resynchronized, the DOS error log is appended to the IO\$LOG.ERR file on volume SYS:.</p>

Table 2-21 *continued*
IOEngine Mirrored Server Parameters (SFT III)

Parameter	Use to
Always Down Server When Power Fails= <i>value</i>	<p>Specify whether the MSEngine is shut down when a power failure is detected.</p> <p>Supported parameters: ON, OFF. Default: ON.</p> <p>Set this parameter to OFF to allow for continued service when both SFT III servers are on separate UPS devices.</p> <p>If the servers are fully synchronized and mirrored, and this parameter is set to OFF, the UPS halts only the IOEngine (rather than shutting down the MSEngine) when power fails.</p> <p>If only one of your SFT III servers has a UPS installed, leave this parameter set to ON.</p>



Don't change the settings for the parameters in Table 2-22 unless you are running SFT III in a testing environment.

Table 2-22

IOEngine Mirrored Servers Error Recovery Options Parameters (SFT III)

Parameter	Use to
Secondary Server MSL Send Blocked Recovery Option= <i>option</i>	<p>Specify the recovery strategy for the secondary server if it detects that the MSL driver is not sending data to the other server at the correct rate.</p> <p>Supported options: 0 = Halt the secondary server. 1 = Halt the primary and secondary servers. 2 = Restart the secondary server.</p> <p>Default: 2.</p>
Primary Server MSL Send Blocked Recovery Option= <i>option</i>	<p>Specify the recovery strategy for the primary server if it detects that the MSL driver is not sending data to the other server at the correct rate.</p> <p>Supported options: 0 = Halt the secondary server. 1 = Halt the primary and secondary servers. 2 = Restart the secondary server.</p> <p>Default: 2.</p>
MSEngine Abend And Processor Exception Recovery Option= <i>option</i>	<p>Specify the recovery strategy for the server that detects MSEngine software abends and MSEngine hardware exceptions.</p> <p>Supported options: 0 = Halt the server. 1 = Restart the server.</p> <p>Default: 1.</p>
Always Halt Secondary If Sync Error= <i>value</i>	<p>Specify whether to halt the secondary server every time an error is detected during mirrored server synchronization.</p> <p>Supported values: ON, OFF. Default: ON.</p>

Table 2-22 *continued***IOEngine Mirrored Servers Error Recovery Options Parameters (SFT III)**

Parameter	Use to
IOEngine Abend And Processor Exception Recovery Option= <i>option</i>	<p>Specify the recovery strategy for the server that detects IOEngine software abends and IOEngine hardware exceptions.</p> <p>Supported options: 0 = Halt the server. 1 = Restart the server.</p> <p>Default: 1.</p>
Machine Check Recovery Option= <i>option</i>	<p>Specify the recovery strategy for the server that detects hardware errors (other than memory parity errors).</p> <p>Supported options: 0 = Halt the server. 1 = Restart the server.</p> <p>Default: 1.</p>
Memory Parity Error Recovery Option= <i>option</i>	<p>Specify the recovery strategy for the server that detects memory parity errors.</p> <p>Supported options: 0 = Halt the server. 1 = Restart the server.</p> <p>Default: 1.</p>
Secondary Server MSL Hardware Failure Recovery Option= <i>option</i>	<p>Specify the recovery strategy for the secondary server detecting an MSL hardware failure.</p> <p>Supported options: 0 = Halt the secondary server. 1 = Halt the primary and secondary servers. 2 = Restart the secondary server using the same MSL. 3 = Restart the secondary server using the alternate MSL.</p> <p>Default: 2.</p> <p>The secondary server performs the set option unless the primary server has failed. If the primary server has failed, the secondary server becomes the new primary server.</p>

Table 2-22 *continued***IOEngine Mirrored Servers Error Recovery Options Parameters (SFT III)**

Parameter	Use to
Primary Server MSL Hardware Failure Recovery Option= <i>option</i>	<p>Specify the recovery strategy for the primary server detecting an MSL hardware failure.</p> <p>Supported options:</p> <p>0 = Halt the secondary server. 1 = Halt the primary and secondary servers. 2 = Restart the secondary server using the same MSL. 3 = Restart the secondary server using the alternate MSL.</p> <p>Default: 2.</p>
MSEngine Outputs Different Recovery Option= <i>option</i>	<p>Specify the recovery strategy for the secondary server detecting that its MSEngine outputs are different from the primary server's MSEngine outputs.</p> <p>Supported options:</p> <p>0 = Halt the secondary server. 1 = Halt the primary and secondary servers. 2 = Restart the secondary server</p> <p>Default: 0.</p>
Secondary Server MSL Consistency Error Recovery Option= <i>option</i>	<p>Specify the recovery strategy for the secondary server detecting communications consistency errors, such as checksum errors, invalid sequence number, or invalid packet type.</p> <p>Supported options:</p> <p>0 = Halt the secondary server. 1 = Halt the primary and secondary servers. 2 = Restart the secondary server using the same MSL. 3 = Restart the secondary server using the alternate MSL.</p> <p>Default: 2.</p> <p>The secondary server performs the set option unless the primary server has failed. If the primary server has failed, the secondary server becomes the new primary server.</p>

Table 2-22 *continued***IOEngine Mirrored Servers Error Recovery Options Parameters (SFT III)**

Parameter	Use to
Primary Server MSL Consistency Error Recovery Option= <i>option</i>	<p>Specify the recovery strategy for the primary server detecting communications consistency errors, such as checksum errors, invalid sequence number, or invalid packet type.</p> <p>Supported options:</p> <p>0 = Halt the secondary server. 1 = Halt the primary and secondary servers. 2 = Restart the secondary server using the same MSL. 3 = Restart the secondary server using the alternate MSL.</p> <p>Default: 2.</p>
Secondary Server MSL Deadlock Recovery Option= <i>option</i>	<p>Specify the recovery strategy for the secondary server detecting an MSL communications delivery deadlock.</p> <p>Supported options:</p> <p>0 = Halt the secondary server. 1 = Halt the primary and secondary servers. 2 = Restart the secondary server</p> <p>Default: 2.</p>
Primary Server MSL Deadlock Recovery Option= <i>option</i>	<p>Specify the recovery strategy for the primary server detecting an MSL communications delivery deadlock.</p> <p>Supported options:</p> <p>0 = Halt the secondary server. 1 = Halt the primary and secondary servers. 2 = Restart the secondary server</p> <p>Default: 2.</p>



Don't change the settings for the parameters in Table 2-23 unless you are running SFT III in a testing environment.

Table 2-23
IOEngine Mirrored Servers Test Options Parameters (SFT III)

Parameter	Use to
Test Mode= <i>option</i>	<p>Test server switchover and recovery with four failure scenarios.</p> <p>Supported options:</p> <p>0 = Don't initiate Test Mode. 1 = Enable a simple halt/restart server test. 2 = Generate MSL errors. 3 = Generate system errors. 4 = Generate errors of types 1, 2, and 3.</p> <p>Default: 0.</p> <p>Note: When you change the Test Mode setting back to 0, all settings for Mirrored Servers Error Recovery Options return to their defaults</p> <p>Suggestion: Because Test Mode options apply only to the primary server, you can set different test options in each server's IOSTART.NCF file. For best performance, however, set the <i>same</i> test options in each server's IOSTART.NCF file.</p>
Stop On Server Test Unexpected Error= <i>value</i>	<p>Specify whether to stop both servers if an unexpected error (not generated by the Test Mode) occurs.</p> <p>Supported values: ON, OFF. Default: ON.</p>
Restart Minimum Delay Amount= <i>time</i>	<p>Specify how many seconds the server waits before executing a restart in Test Mode.</p> <p>Supported times: 0 seconds to 23 hours 43 minutes 40.1 seconds. Default: 10 seconds.</p> <p>This setting is added to the random number generated by the Restart Maximum Random Delay Amount parameter to determine the actual delay amount.</p> <p>If you notice several communications deadlocks or initialization failures while running your servers in Test Mode, use this parameter to allow more time for the server to finish switchover before restarting.</p>

Table 2-23 *continued***IOEngine Mirrored Servers Test Options Parameters (SFT III)**

Parameter	Use to
Server Test Minimum Delay Amount= <i>time</i>	<p>Specify how many seconds the server waits before initiating the Test Mode option.</p> <p>Supported times: 0 seconds to 23 hours 43 minutes 40.1 seconds. Default: 3 minutes.</p> <p>This setting is added to the random number generated by the Server Test Maximum Random Delay Amount parameter to determine the actual delay amount.</p> <p>Use this parameter to reduce the number of workstation pauses caused by frequent server resynchronization while running in Server Test Mode.</p>
Restart Maximum Random Delay Amount= <i>time</i>	<p>Specify the maximum random number that the server generates to add to the Restart Minimum Delay Amount. The resulting sum is the number of seconds the server waits before executing a restart in Test Mode.</p> <p>Supported times: 0 seconds to 59 minutes 19.2 seconds. Default: 0 seconds.</p>
Server Test Maximum Random Delay Amount= <i>time</i>	<p>Specify the maximum random number that the server generates to add to the Server Test Minimum Delay Amount. The resulting sum is the number of seconds the server waits before initiating the Test Mode option.</p> <p>Supported times: 0 seconds to 59 minutes 19.2 seconds. Default: 19.8 seconds.</p>

Table 2-24

IOEngine Error Handling Parameters (SFT III)

Parameter	Use to
Status Dump File State= <i>number</i>	<p>Specify the action to take if the MSSTATUS.DMP file size exceeds the size limit.</p> <p>Supported values: 0 = Take no action if the file grows too large. 1 = Delete the log file if it grows too large. 2 = Rename the log file if it grows too large.</p> <p>Default: 1.</p>
IOEngine Error Log File State= <i>number</i>	<p>Specify the action to take if the IO\$LOG.ERR file size exceeds the size limit.</p> <p>Supported values: 0 = Take no action if the file grows too large. 1 = Delete the log file if it grows too large. 2 = Rename the log file if it grows too large.</p> <p>Default: 1.</p>
Status Dump File Overflow Size= <i>number</i>	<p>Specify the size limit for the MSSTATUS.DMP file.</p> <p>Supported values: 65536 to 4294967295 bytes. Default: 4194304 bytes.</p>
IOEngine Error Log File Overflow Size= <i>number</i>	<p>Specify the size limit for the IO\$LOG.ERR file.</p> <p>Supported values: 65536 to 4294967295 bytes. Default: 4194304 bytes.</p>

Additional Information

Topic	See
Using SERVMAN to change set parameters	"SERVMAN" (page 295)
Controlling file compression	"Using SET to Control File Compression" in Chapter 7 of <i>Supervising the Network</i> .
Improving server performance	"Improving Server Performance" in Chapter 7 of <i>Supervising the Network</i> .
Editing .NCF files	"Creating or Editing a Server Batch (.NCF) File" in Chapter 7 of <i>Supervising the Network</i> .
Time synchronization and the TIMESYNC.CFG file	"Managing Network Time Synchronization" in Chapter 7 of <i>Supervising the Network</i> .

SET TIME

Purpose

Use at the server console to set the date and time kept by the server.



Setting the time incorrectly can adversely affect the performance of NetWare Directory Services (NDS).

Because time synchronization between servers is critical to NDS, make sure you understand time synchronization before you change the time or time zone on a server. (For more information, see "Managing Network Time Synchronization" in Chapter 7 of *Supervising the Network*.)

Syntax

SET TIME *mo/day/yr hr:min:sec*

Parameter	Use to
<i>mo/day/yr</i>	Specify the date. Use any of these formats for the date: 9/28/93 September 28, 1993 28 September 1993

SET TIME

Parameter	Use to
<i>hr:min:sec</i>	<p>Specify the time.</p> <p>Enter the time in either standard or 24-hour-clock format:</p> <p>1:15:32 p.m. (standard format) 13:15:32 (24-hour-clock format)</p> <p>Separate hours, minutes, and seconds with colons. You can omit the minute and second entries, but you must include the colon after the hour.</p> <p>Specify a.m. or p.m. (for example, 7:14:32 AM). If you don't specify a.m. or p.m., NetWare 4.1 assumes you are entering the time in 24-hour-clock format.</p> <p>For example, if you enter 1:00, the time is set to 1:00 a.m. If you enter 13:00, the time is set to 1:00 p.m.</p>

Using SET TIME

- ◆ SET TIME is most appropriately used on a Reference or Single Reference time server. These types of time servers don't change their time to converge with other servers, but supply the time for other servers.

If you change the time on a Primary, Reference, or Single Reference time server, you will affect the time on all other servers that refer to that time server. (They will converge to the new time.)
- ◆ You can set both the date and the time in the same command or separately. You can enter either the date or the time first. If you replace only one variable, the other remains unaffected.
- ◆ The time display is formatted according to the server language standards. (For example, in the U.S. the format is 1:15:32 PM.)

Examples

To set the date and time on your server to December 19, 1994 at 2:15 PM, type

SET TIME 12/19/94 2:15:00 PM

or

SET TIME DECEMBER 19, 1994 14:15:00

Additional Information

Topic	See
Displaying the server's time	"TIME" (page 406)
Setting the time zone	"SET TIME ZONE" (page 384)
Network time synchronization	"Managing Network Time Synchronization" in Chapter 7 of <i>Supervising the Network</i> .

SET TIME ZONE

Purpose

Use at the server console to configure time zone information.



Because time synchronization between servers is critical to NetWare Directory Services, make sure you understand time synchronization before you change the time or time zone on a server. (For more information, see “Managing Network Time Synchronization” in Chapter 7 of *Supervising the Network*.)

Syntax

SET TIME ZONE zone [+|-] hr:min:sec [daylight]

Parameter	Use to
(no parameter)	Display time zone setting.
<i>zone</i>	Specify a standard abbreviation for the name of the time zone. Examples: EST (Eastern Standard Time) CST (Central Standard Time) MST (Mountain Standard Time) PST (Pacific Standard Time)
[+ -]	Specify the number of hours east or west of the Coordinated Universal Time (UTC) meridian. Note: UTC has been known historically as Greenwich Mean Time or GMT. Use + (plus) to set time zones west of UTC. Use – (minus) to set time zones east of UTC. (If you don't enter this parameter, the default is +.)

Parameter	Use to
<i>hr:min:sec</i>	Specify the time difference between UTC and the local time zone. You can specify this difference simply in hours. Or, for extreme accuracy, specify hours, minutes and seconds.
<i>daylight</i>	<p>Specify the standard abbreviation for the time zone during Daylight Saving Time (DST).</p> <p>Don't enter this abbreviation if you don't observe DST.</p> <p>Examples:</p> <p>EDT (Eastern Daylight Time) CDT (Central Daylight Time) MDT (Mountain Daylight Time) PDT (Pacific Daylight Time)</p> <p>Important: This parameter does not turn on Daylight Saving Time. You turn on Daylight Saving Time (and configure related parameters) by using the SET command.</p>

Using SET TIME ZONE

- ◆ Time zone information is critical to time synchronization for NetWare Directory Services. Additionally, time zone information is provided to modules that make calls to CLIB.
- ◆ You specify the abbreviation the operating system uses for daylightsaving time with the SET TIME ZONE *daylight* parameter. You turn on daylight saving time and set the start and end date with the SET command.
- ◆ If you don't set the time zone, there are no standard abbreviations and the time zone offset is zero.

Examples

- ◆ To display the time zone setting, type

SET TIME ZONE

- ◆ To set the time zone to mountain standard time, type

SET TIME ZONE MST7

(This example applies to an area that doesn't observe daylight saving time.)

- ◆ To set the time zone to Pacific standard time and set the abbreviation for daylight saving time, type

SET TIME ZONE PST8PDT

(When daylight saving time is active, PST will be known as PDT.)

- ◆ To set the time zone for Germany (Mid-European Time), type

SET TIME ZONE MET-1

The -1 sets the time zone 1 hour ahead of UTC, since Germany is 1 hour east of the UTC meridian.

Additional Information

Topic	See
Displaying the server's time	"TIME" (page 406)
Setting the server's time	"SET TIME" (page 381)
Turning on daylight saving time and setting related parameters	"SET" (page 299)
Network time synchronization	"Managing Network Time Synchronization" in Chapter 7 of <i>Supervising the Network</i> .

SETPASS

Purpose

Use at a workstation to change a user's password.

Syntax

SETPASS [*servername/*] [*username*] [/? | /VER]

Parameter	Use to
(no parameter)	Change your password on the network.
<i>servername/</i>	Replace with the name of the server where you want to change the user's password.
<i>username</i>	Replace with the name of the user whose password you want to change.
/?	View online help. All other parameters are ignored when /? is used.
/VER	View the version number of the utility and the list of files it uses to execute. All other parameters are ignored when /VER is used.

Examples

- ◆ To change your password on the network, type

SETPASS

- ◆ To change user BARNEY's password (if you have rights), type

SETPASS BARNEY

- ◆ To change user JAY's password on server HACKER, type

SETPASS HACKER/JAY

- ◆ To change your password on server FRIENDLY, type

SETPASS FRIENDLY/

SETTTS

Purpose

Use at a workstation to

- ◆ Set the logical record locks for the Transaction Tracking System (TTS)
- ◆ Set the physical record locks for TTS
- ◆ View the logical and physical locks for TTS

Syntax

```
SETTTS [logical level [physical level] [/options...]]  
[/? | /VER]
```

Parameter	Use to
<i>logical level</i>	Specify the logical number value you want to set.
<i>physical level</i>	Specify the physical number value you want to set.
/?	View online help.
/option	Replace <i>option</i> with any available option. See "SETTTS Options" on page 390.
/VER	View the version number of the utility and the list of files needed to run the utility.

Using SETTTS

- ◆ When you log out from or turn off your workstation, the settings are reset to 0.
- ◆ TTS values are 0 to 254. The *logical level* and *physical level* values indicate how many record locks TTS will ignore before tracking the transaction.
Setting the to 1 means that TTS tracks each transaction; setting it to 254 means that TTS ignores 253 record locks before it tracks.
- ◆ A value of 255 or /D disables a level.

SETTTS Options

Option	Use to
/C	Scroll continuously through the report of accounting charges.
/N	Set the logical and physical settings to 0.
/D	Disable the logical and physical settings.

Examples

- ◆ To see the logical and physical settings, type
SETTTS
- ◆ To reset both logical and physical settings to the default (0), type
SETTTS /N

- ◆ To disable both logical and physical settings, type

SETTTS /D

- ◆ To disable the logical level and set the physical level to 4, type

SETTTS /D 4

Additional Information

Topic	See
Transaction tracking	"Transaction Tracking System" in <i>Concepts</i> .

SPEED

Purpose

Use at the server console to display the speed at which the processor is running.

Syntax

SPEED

About Processor Speed

- ◆ Processor speed rating is determined by
 - ◆ CPU clock speed (33 MHz, 50 MHz, 66 MHz, or 90 MHz)
 - ◆ CPU type (80386, 80486, Pentium, etc.)
 - ◆ Number of memory wait states (0, 1, 2, etc.)
- ◆ If your computer has a slower rating than you expected, use SPEED to check the CPU speed rating.

An 80386 CPU running at 33 MHz should get a rating of about 320. An 80486 CPU running at 50 MHz should get a rating of about 1370. A Pentium CPU running at 66 MHz should get a rating of about 3660.

- ◆ Some computers have an Auto or Common CPU speed mode that can reduce the clock speed to as little as 6 MHz.
- ◆ For NetWare 4 operation, the CPU should be set to the highest speed. If your machine has a slower rating than expected, check the CPU speed setting.

See your computer's documentation for instructions on how to set the CPU speed.

SPXCONFIG

Purpose

Use at the server console to configure certain SPX™ parameters.



Note These parameters can also be configured from the INETCFG utility.

Syntax

LOAD SPXCONFIG [option[=value]]

Parameter	Use to
(no parameter)	Load SPXCONFIG and display configuration menu.
<i>option</i>	Replace <i>option</i> with any available option. See “SPXCONFIG Options” on page 394.
<i>value</i>	Specify a numerical value for an option.
	For information on setting these values, see “INETCFG” on page 95 and <i>NetWare IPX Reference</i> .

SPXCONFIG Options

Option	Use to
A=	Specify SPX Watchdog Abort timeout (in ticks).
V=	Specify SPX Watchdog Verify timeout (in ticks).
W=	Specify SPX Ack Wait timeout (in ticks).
R=	Specify SPX Default Retry count.
S=	Specify maximum concurrent SPX sessions.
Q=1	Specify quiet mode (suppresses display of changed settings).
H	Display SPXCONFIG help screen.
I=	Specify IPX maximum socket table size.

Using SPXCONFIG

- ◆ You can use SPXCONFIG in your AUTOEXEC.NCF file, as a console command, as a menu utility, or as a configuration file that is invoked by INETCFG.
- ◆ If you don't specify a parameter, the following menu appears:

SPX Configuration Control Program

1. SPX Watchdog Abort timeout 540
2. SPX Watchdog Verify timeout 54
3. SPX Ack wait timeout 108
4. SPX Default Retry count 10
5. Maximum concurrent SPX sessions 2048
6. IPX maximum socket table size 1200

You can then select parameters to change.

- ◆ SPXCONFIG changes the configuration of SPX as well as the STREAMS-based SPXS (SPXII).
 - ◆ If you enabled TCP/IP or AppleTalk on the server, you can use either INETCFG or SPXCONFIG to set SPX parameters.

When you set the parameters using INETCFG, a load line for SPXCONFIG is automatically added to the NETINFO.CFG file so it runs each time you bring up the server.

- ◆ If you have only IPX/SPX enabled on the server (and not TCP/IP or AppleTalk) and you want to use the SPXCONFIG parameters each time you boot the server, place the following command in your AUTOEXEC.NCF file:

LOAD [path]SPXCONFIG [option[=value]]

Examples

To set SPX options to 1000 ticks for the SPX Watchdog Abort timeout and suppress the display of changed settings, type

LOAD SPXCONFIG A=1000 Q=1

Additional Information

Topic	See
Setting parameters in an .NCF file	"Creating or Editing a Server Batch (.NCF) File" in Chapter 7 of <i>Supervising the Network</i> .
Setting SPX parameters with INETCFG	"INETCFG" (page 95).

SPXS

Purpose

Use at the server console to provide STREAMS-based SPX protocol services.

Syntax

LOAD [path]SPXS [LDFILE = [path]filename[ext]]

Parameter	Use to
<i>path</i>	Specify the path to SPXS if you moved it from the default directory.
LDFILE = <i>filename</i> [<i>ext</i>]	Load the data file that contains the SPX timer defaults and physical packet size tables.
	If you don't specify a filename, SPXS sets the parameters defined in the IPXSPX.CFG file.
	If you don't specify a file extension, the default is .CFG.

Using SPXS

- ◆ When you load SPXS, the parameters in the IPXSPX.CFG file are set, unless you specify an alternate configuration filename.



The IPXSPX.CFG file is modified from the INETCFG utility when you set SPX/IPX parameters.

- ◆ You can create multiple configuration files in addition to IPXSPX.CFG. Use this feature if you frequently alternate between two or more IPX/SPX configurations.

To create multiple configuration files, copy the IPXSPX.CFG file to a new filename (IPXSPX2.CFG, for example). Then you can change the IPXSPX.CFG file (by using INETCFG) and still preserve the original configuration in the IPXSPX2.CFG file.

- ◆ To load a configuration file other than the default IPXSPX.CFG file, use the LDFILE option.

For example, if you have a second configuration file called IPXSPX2.CFG, you can load that configuration by typing

LOAD SPXS LDFILE = IPXSPX2

- ◆ When you load SPXS, STREAMS is autoloaded.

Additional Information

Topic	See
Setting SPX parameters using SPXCONFIG	"SPXCONFIG" (page 393).
Setting parameters in an .NCF file	"Creating or Editing a Server Batch (.NCF) File" in Chapter 7 of <i>Supervising the Network</i> .
Setting SPX parameters using INETCFG	"INETCFG" (page 95).

STREAMS

Purpose

Use at the server console with an loadable module that requires CLIB or uses STREAMS-based protocol services.



Normally, you won't need to load STREAMS because it is autoloaded by CLIB and other modules when needed.

Syntax

LOAD [path] STREAMS [MAX MESSAGE SIZE = *n*]

Parameter	Use to
<i>path</i>	Specify the path to STREAMS if you moved it from the default directory.
MAX MESSAGE SIZE = <i>n</i>	Specify the maximum message size in bytes. This value can be between 4,096 and 65,535 bytes. The default is 8,192 bytes.

Using STREAMS

- ◆ STREAMS will not load unless CLIB is loaded. When CLIB loads, it autoloads STREAMS.
- ◆ Increasing maximum message size can improve the performance of some protocol stacks.
- ◆ If STREAMS is autoloaded, the default value for MAX MESSAGE SIZE is used. To change this size, unload STREAMS and load again, specifying a new MAX MESSAGE SIZE value.

- ◆ Both SPX II and AppleTalk Filing Protocol (AFP) can use a larger maximum message size.



SPX II is an improved version of SPX that yields better performance with some applications. STREAMS uses SPX II.

- ◆ Don't set maximum message size higher than 16K. The performance benefit gained doesn't compensate for the extra server memory consumed by the protocol stacks.

SYSTIME

Purpose

Use at a workstation to synchronize the date and time set on your station with those of the server.

Syntax

SYSTIME [*server name*] [/? | /VER]

Parameters	Use to
<i>server name</i>	Specify the name of the server that you want to synchronize your workstation with.
/?	View online help. All other parameters are ignored when /? is used.
/VER	View the version number of the utility and the list of files it uses to execute. All other parameters are ignored when /VER is used.

Examples

- ◆ To synchronize your workstation's date and time with those of the default server, type

SYSTIME

- ◆ To synchronize your workstation's date and time with those of server SCOTTY, type

SYSTIME SCOTTY

- ◆ To synchronize your workstation's date and time with those of server FISHBONE in the context NOVELL.US, type

SYSTIME .FISHBONE.NOVELL.US

Additional Information

Topic	See
Synchronization	"Time synchronization" in <i>Concepts</i> .

TCPCON

Purpose

Use at the server console to

- ◆ Monitor activity in the TCP/IP network segments of your internetwork
- ◆ View configuration and statistics information about the following TCP/IP protocols: IP, ICMP, UDP, TCP, OSPF, and EGP
- ◆ View IP routes known to a TCP/IP node
- ◆ View network interfaces supported by a TCP/IP node
- ◆ Access the trap log maintained by SNMPLOG (local systems only)
- ◆ Use Simple Network Management Protocol (SNMP) over TCP/IP or IPX to access TCP/IP information in any remote protocol stack supporting the TCP/IP Management Information Base (MIB)

Syntax

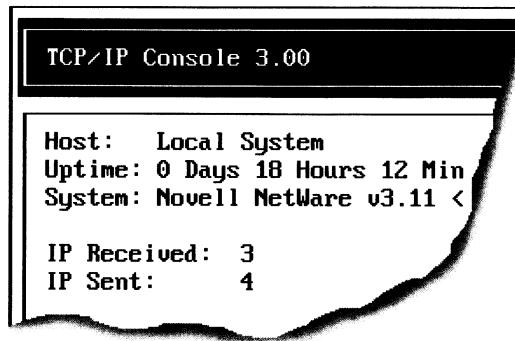
LOAD TCPCON

Using TCP/CON

- ◆ By default, TCP/CON monitors and gathers information from the local NetWare TCP/IP node.

You can, however, access another TCP/IP node on your internetwork if you know the symbolic hostname or host IP address of that node.

- ◆ When you load TCP/CON, the TCP/CON main screen appears:



- ◆ The top of the main screen displays a summary of statistics for the selected host, as follows:

Field	Explanation
Host	Symbolic host name or IP address of the selected TCP/IP host (or server name if accessing a remote node using IPX) being queried. This is the host specified in "SNMP Access Configuration" in the "Available Options" menu.
Uptime	Amount of time that has elapsed since the selected host was last initialized.
System	Brief description of the selected host.

Field	Explanation
IP Received	Number of IP datagrams received from all interfaces, including those received in error.
IP Sent	Number of datagrams sent to IP for transmission. This number does not include datagrams forwarded by this host.
IP Forwarded	Number of IP packets forwarded from one node to another. This field displays the value "Disabled" if this host is not configured to be an IP router.
TCP Received	Number of TCP segments received, including those received in error.
TCP Sent	Number of TCP segments sent, excluding those containing retransmitted data.
TCP Connections	Number of currently established TCP connections.

- ◆ The "Available Options" menu on the main screen allows access to additional features of TCP/CON, as follows::

Option	Use to
SNMP Access Configuration	View and modify TCP/CON options.
Protocol Information	View protocol information for the selected host.
IP Routing Table	View IP routers known to the selected host.
Statistics	View TCP/IP statistics.
Interfaces	View the network interfaces supported by the selected host.
Display Local Traps	View the local SNMP trap log maintained by SNMPLOG.NLM.

Additional Information

Topic	See
TCP/IP and related protocols	<i>NetWare TCP/IP Reference.</i>
IP routing	<i>NetWare TCP/IP Reference.</i>

TIME

Purpose

Use at the server console to display

- ◆ Date and time kept by the NetWare server's clock
- ◆ Daylight-saving-time status
- ◆ Time synchronization information

Syntax

TIME

Using TIME

- ◆ When you execute TIME, information similar to the following appears on the console screen:

Note



The output is formatted according to your locale configuration.

Figure 2-21
TIME Output

```
SALES:time
  Time zone string: "MST?MDT"
  DST status: OFF
  DST start: Sunday, April 4, 1993 2:00:00 am MST
  DST end:   Sunday, October 31, 1993  2:00:00 am MDT
  Time synchronization is active.
  Time is synchronized to the network.
Monday, June 11, 1993 7:06:59 pm UTC
Monday, June 11, 1993 12:06:59 pm MST
```

- ◆ To reset the server's date or time, use SET TIME.

Additional Information

Topic	See
Setting the server's time	"SET TIME" (page 381)
Setting the time zone	"SET TIME ZONE" (page 384)
Network time synchronization	"Managing Network Time Synchronization" in Chapter 7 of <i>Supervising the Network</i> .

TIMESYNC

Purpose

Use at the server console to monitor the internal time on a server to ensure that the time reported by all servers across the network is consistent, or synchronized.

TIMESYNC autoloads when the server boots. Under very few circumstances will you ever load or unload TIMESYNC. You may, however, want to load TIMESYNC to use an alternate configuration (.CFG) file.

Syntax

LOAD [path]TIMESYNC

Parameter	Use to
<i>path</i>	Specify the path to TIMESYNC.NLM if you moved it from the default directory.

You can set TIMESYNC parameters in the configuration file (TIMESYNC.CFG) or with the SET and SERVMAN utilities.

Additional Information

Topic	See
Setting time synchronization parameters	"Time Synchronization Parameters" (page 335) in "SET"
Managing network time synchronization	"Managing Network Time Synchronization" in Chapter 7 of <i>Supervising the Network</i>

TLI

Purpose

Use at the server console to provide Transport Level Interface (TLI) communication services.

Syntax

LOAD [path]TLI

Parameter	Use to
<i>path</i>	Specify the path to TLI.NLM if you moved it from the default directory.

Using TLI

- ◆ To use TLI, you must have one or more protocol service modules loaded, such as SPXS or IPXS.
- ◆ TLI also requires STREAMS and CLIB and autoloads them if you haven't.

TPING

Purpose

Use at the server console to send an Internet Control Message Protocol (ICMP) echo request packet to an IP node on your internetwork.

TPING is a command line utility that determines whether an IP target node on your internetwork is reachable.

Syntax

LOAD TPING *host* [*packet size* [*retry count*]]

Parameter	Use to
<i>host</i>	Specify the symbolic host name or IP address of a TCP/IP system on the network.
<i>packet size</i>	Specify the size, in bytes, of the ICMP packet.
<i>retry count</i>	Specify the number of times you want to resend an ICMP packet to the host system if a reply is not received (default = 5).

Using TPING

- ◆ TPING sends an ICMP echo request packet to the IP target node. If the target node receives the request packet, it sends back a reply packet.

If TPING doesn't receive a reply, it resends the request packet the specified number of times.

When TPING receives a reply, it stops sending requests and displays a message indicating that the target node is reachable. (If it doesn't receive a reply, TPING also notifies you.)

Additional Information

Topic	See
TCP/IP and related protocols	<i>NetWare TCP/IP Reference.</i>

TRACK OFF

Purpose

Use at the server console to prevent the server from displaying the "RIP Tracking Screen." This screen displays Router Information Protocol (RIP) traffic on the server.

Syntax

TRACK OFF

Additional Information

Topic	See
RIP Tracking Screen	" TRACK ON " (page 413).

TRACK ON

Purpose

Use at the server console to view the “RIP Tracking Screen” and make it the active screen. This screen displays Router Information Protocol (RIP) traffic on the server.

Syntax

TRACK ON

Using TRACK ON

- ◆ TRACK ON signals the router to display all server and network routing (RIP) packets that are received or sent.
- ◆ TRACK ON displays information about servers, networks, and connection requests.

This information is formatted according to whether the NetWare server is

- ◆ Receiving incoming information (IN)
- ◆ Broadcasting outgoing information (OUT)
- ◆ Receiving a connection request

Incoming Information

Incoming information looks similar to the following:

```
IN [00D0C200:00001B026C09] 10:53:01am 010123C5 11/22
5300DEEF 3/4 00001EF0 5/365
FADE2401 12/98 00001EEE 2/3 C9008617 5/11
```

The packet is incoming from network address 00D0C200 and from the server at node address 00001B026C09. The packet was sent at 10:53 am.

- ◆ The columns of data that follow the line labeled “IN” are network numbers that the sending server knows about. For example:
- ◆ 010123C5 and 5300DEEF are the network numbers recognized by the server at address 00001B026C09.
- ◆ The numbers 11/22 and 3/4 indicate routing information about that network. For example, the “11/” and “3/” indicate the hop count, or number of hops (gateways or routers) from the sending server to this network.



The maximum number of hops a RIP packet travels is 16.

The “/22” and “/4 indicate the number of ticks (1/18th of a second) that a packet took to reach this network from the sending server.

Outgoing Information

Outgoing information looks similar to the following:

```
OUT [1986DAD0:8941A801] 11:00:01am
00001EEE 2/3 5300DEEF 3/4 00001EF0 5/365
FADE2401 2/3 FEED00BB 4/5 ACCCDDDD 5/11
```

The packet is outgoing from network address 1986DAD0 and from the server at node address 8941A801. The packet was sent at 11:00 am.

The columns of data that follow the line labeled “OUT” are network numbers that the sending server knows about. The associated hop and tick count information is listed after each network. For an explanation of these, see “Incoming Information” on page 413.

Connection Request

When a client boots and loads a NetWare Requester™ (such as DOS Requester or OS/2 Requester), a "Get Nearest Server" request is broadcast on the network the station is cabled to.

Any connected server can receive the message and respond to the station with a "Give Nearest Server" response.

The station initially attaches to the first server that responds to the "Get Nearest Server" request.

Additional Information

Topic	See
Turning off the "RIP Tracking Screen"	" TRACK OFF " (page 412)
Displaying advertised networks (SAP traffic)	" DISPLAY NETWORKS " (page 52)
Displaying advertised servers (SAP traffic)	" DISPLAY SERVERS " (page 53)
Resetting routers	" RESET ROUTER " (page 258)

UIMPORT

Purpose

Use at a workstation to import user information from an existing database into the NetWare Directory Services (NDS) database.

Syntax

UIMPORT [*control file*] [*data file*] [/C] [/? | /VER]

Parameter	Use to
<i>control file</i>	Specify the name of the file that gives UIMPORT information on how to load user data into the directory.
<i>data file</i>	Specify the name of the ASCII file that contains attribute values.
/C	Scroll continuously through output. UIMPORT without /C will pause after outputting each page of information.
/?	View online help. All other parameters are ignored when /? is used.
/VER	View the version number of the utility and the list of files it uses to execute. All other parameters are ignored when /VER is used.

Additional Information

Topic	See
Using UIMPORT	"Importing User Information into the Directory Services Database" in Chapter 5 of <i>Supervising the Network</i> .

UNBIND

Purpose

Use at the server console to

- ◆ Remove a communication protocol from the LAN driver of a network board
- ◆ Disable communication on a specific board

Syntax

```
UNBIND protocol [FROM] LAN_driver | board_name  
[[driver parameter...]]
```

Parameter	Use to
<i>protocol</i>	Specify the name of the protocol you want to unbind.
<i>LAN_driver</i> <i>board_name</i>	Specify the name of the LAN driver or the network board from which you are unbinding the protocol.
<i>driver parameter</i>	Specify one or more driver parameters if you have more than one network board of the same type in your server. See “UNBIND Driver Parameters” on page 417.
Note: Enclose driver parameters in square brackets.	

UNBIND Driver Parameters

Driver parameter	Use to
[DMA=number]	Specify the DMA channel for the board. Use the same channel you did when you loaded the driver.
[FRAME=number]	Specify the frame type for the board. Use the same frame type you did when you loaded the driver.
[INT=number]	Specify the interrupt for the board. Use the same interrupt you did when you loaded the driver.
[MEM=number]	Specify the memory address for the board. Use the same memory address you did when you loaded the driver.
[PORT=number]	Specify the I/O port for the board. Use the same I/O port you did when you loaded the driver.
[SLOT=number]	Specify the network board by the slot that it was installed in.
	Use this parameter with microchannel and EISA computers. Use the same slot number you did when you loaded the driver.
[NODE=number]	Specify the node number of the board.

Using Driver Parameters

- ◆ You must tell the operating system which network board or LAN driver to unbind the communication protocol from.
- ◆ If you have multiple boards or LAN drivers, you must unbind each one separately.
- ◆ If your server has more than one instance of the LAN driver loaded, use one or more driver parameters to specify the particular board you are unbinding.
- ◆ To prevent a driver from binding automatically when the server boots, delete the following line from the AUTOEXEC.NCF file:

BIND IPX TO LAN_driver NET=number

Examples

- ◆ To unbind IPX from an NE3200 driver that has been loaded only once, type

UNBIND IPX FROM NE3200

- ◆ To unbind IPX from an NE3200 driver that has been loaded more than once, using driver parameters to specify the particular network board, type

UNBIND IPX FROM NE3200 [SLOT=3, FRAME=ETHERNET_II]

Additional Information

Topic	See
Viewing a list of communication protocols	"PROTOCOL" (page 228).

UNLOAD

Purpose

Use at the server console to

- ◆ Unload a loadable module that was previously loaded with the LOAD command
- ◆ Unload old NLM files so that updated modules can be loaded

Syntax

UNLOAD *NLM_name*

Parameter	Use to
<i>NLM_name</i>	Specify the module you want to unload.



Before unloading a module, read the following section, “Unloading Modules.”

Unloading Modules

When you unload a module, all resources are returned to the system.

Some modules will not unload because other modules depend on them. For example, CLIB, STREAMS, and MSM load automatically when they are needed by another module. For more information, see “Autoloaded Modules” on page 492.

You can unload LAN drivers, name space modules, or disk drivers.

◆ LAN Drivers

When you unload a LAN driver, the driver is unbound from all communication protocols and removed from all network boards it was linked to.

After a LAN driver is unloaded, users with network boards that require the unloaded driver receive the following error message:

Network error on Server <fileserver>: Error receiving from network. Abort, Retry?

If this occurs, do the following:

- ◆ Retry once to see if an alternate route to the NetWare server is available on another network.
- ◆ If the retry fails, retry again after the LAN driver is reloaded and bound to the communication protocol.

A user who receives the error message must reestablish a connection within 15 minutes. If the connection is broken for more than 15 minutes, the server watchdog terminates the station's connection.

If the LAN driver will be unloaded for 15 minutes or longer, have users log out before unloading the LAN driver.

◆ Name Space Modules

Before unloading name space modules, dismount all volumes that are using the module. These volumes cannot be remounted until the module is loaded again.

To permanently delete a name space from a volume before you unload the name space module, use VREPAIR.

◆ Disk Drivers

Before unloading a disk driver, dismount all volumes stored on the hard disks connected to the controller or host bus adapter.

UNLOAD

If you don't dismount the volumes, the system warns you that the driver is in use and lists the volumes using the driver.

If you override the warning and unload the driver without dismounting the volumes, the server dismounts the volumes and notifies those who are using the volumes.

Examples

To unload MONITOR, type

UNLOAD MONITOR

UPS

Purpose

- ◆ Provide the software link between your server and an uninterruptible power supply (UPS) attached to the server
- ◆ Activate UPS monitoring

Syntax

```
LOAD [path]UPS [TYPE=name] [PORT=number]
[DISCHARGE=number] [RECHARGE=number] [WAIT=number]
```

Parameter	Use to
<i>path</i>	Specify the path to UPS if you moved it from the default directory.
TYPE= <i>name</i>	Specify the name of the hardware interface for your UPS (DCB, STANDALONE, KEYCARD, MOUSE, other). Note: If you enter STANDALONE and it is not accepted, try KEYCARD.
PORT= <i>number</i>	Specify the hexadecimal number corresponding to the jumper setting on the board. Possible values for each type of board are: DCB: 346, 34E, 326, 32E, 386, 38E. Standalone: 240, 23.1 Keycard: 230, 238. Mouse (no number required). Other (see board documentation).

Parameter	Use to
DISCHARGE = <i>number</i>	Specify an estimate of the number of minutes the network can operate on battery power before depleting the battery. (Consult the battery's documentation.) Range: 1 to 3976821 minutes. Default: 20.
RECHARGE = <i>number</i>	Specify an estimate of the minutes the battery needs to fully charge. Range: 1 to 3976821 minutes. Default: 60.
WAIT = <i>number</i>	Specify the number of seconds you want the UPS to wait following a power interruption before being activated. Range: 1 to 300 seconds. Default: 15.

Using UPS

- ◆ You must load a UPS hardware driver to interface with the hardware adapter board. Consult with the documentation that came with your UPS adapter board for more information on the driver you should use.

If the UPS module has been loaded but a UPS hardware driver has not, you will receive an error message.
- ◆ You are prompted for all parameters you haven't specified except the WAIT parameter.
- ◆ As your UPS becomes older, you may need to decrease the discharge time or increase the recharge time. See "UPS TIME" on page 429 for more information.
- ◆ Place the LOAD UPS command in your AUTOEXEC.NCF file to load it each time the server comes up.

Additional Information

Topic	See
Adding an uninterruptible power supply (UPS)	"Activating UPS Monitoring" in Chapter 7 of <i>Supervising the Network</i> .



UPS STATUS

Purpose

Use at the server console to view information about the uninterruptible power supply (UPS) attached to the NetWare server.

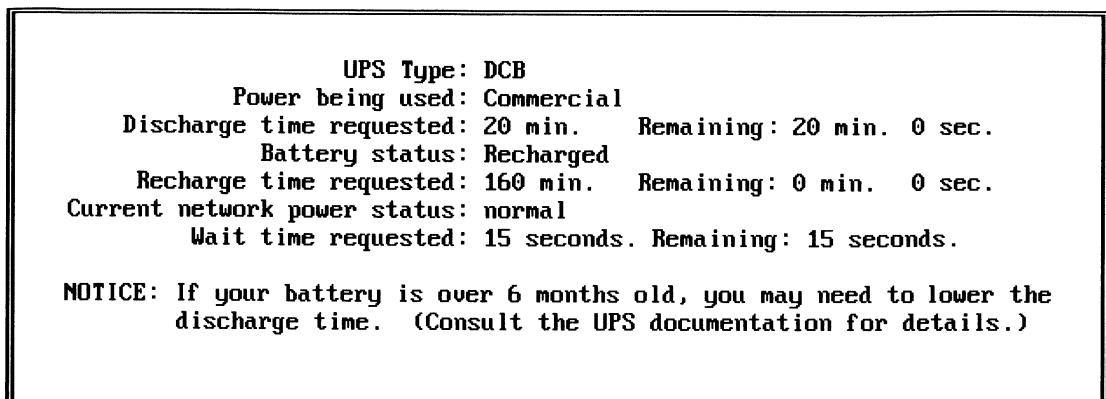
Syntax

UPS STATUS

Using UPS STATUS

- ◆ This command is valid only if the UPS module is loaded and either the type is specified or the UPS adapter driver module is loaded. If the UPS module has not been loaded, the error message "??? Unknown command???" is displayed when you try to execute UPS STATUS.
- ◆ If the UPS module has been loaded but no hardware driver has been loaded, an error message is displayed and the command is not executed.
- ◆ When UPS STATUS is executed, information similar to the following appears:

Figure 2-22
UPS STATUS screen



The fields in the UPS STATUS display are explained in the following table.

Screen Output	Explanation
UPS Type	The type of hardware handling the UPS. This line shows the name of the module if there is not a recognizable UPS hardware type.
Power being used	Possible values: Commercial, Battery
Discharge time requested / Remaining	Discharge time requested: an estimate of the time that the network can run safely on battery power. Remaining: the safe time remaining if the network is on battery power.
	If the network is running on commercial power and the battery is charged, the two values are the same.

UPS STATUS

Screen Output	Explanation
Battery status	Possible values: Charged, Low, Being Charged. If the battery status is low, repair or replace the battery.
Recharge time requested / Remaining	Recharge time requested: an estimate of the time needed to charge the battery after it has been totally discharged. Remaining: an estimate of the time needed to charge the battery in its current state. If the network is running on commercial power, the time needed to charge the battery is 0 if the battery is fully charged. If the network is running on battery power, this number increases as the battery is discharged.
Current network power status	Possible values are as follows: Normal: Running on commercial power. Server down: Running on battery power. Server going down in x minutes: Running on battery power; enough power is left to run the network for the indicated number of minutes.

Additional Information

Topic	See
Changing UPS time parameters	"UPS TIME" (page 429).

UPS TIME

Purpose

Use at the server console to

- ◆ Change the amount of time you want to allow the server to function on battery power
- ◆ Change the time you estimate the battery needs to charge fully
- ◆ Change the time interval between a power interruption and UPS activation

Syntax

**UPS TIME [DISCHARGE=*number*] [RECHARGE=*number*]
[WAIT=*number*]**

Parameter	Use to
DISCHARGE = <i>number</i>	Specify an estimate of the number of minutes the server can operate on battery power before depleting the battery. (Consult the battery's documentation.) Range: 1 to 3976821 minutes. Default: 20.
RECHARGE = <i>number</i>	Specify an estimate of the minutes the battery needs to fully charge. Range: 1 to 3976821 minutes. Default: 60.
WAIT = <i>number</i>	Specify the number of seconds you want the UPS to wait following a power interruption before being activated. Range: 1 to 300 seconds. Default: 15.

Using UPS TIME

- ◆ The parameters described in the preceding table are identical to some of the parameters used when loading UPS.NLM. Use UPS TIME to change these parameters, or change them when you load UPS.NLM.
- ◆ If the UPS module has not been loaded, the error message “??? Unknown command???” is displayed when you try to execute UPS TIME.

If the UPS module has been loaded but a UPS hardware driver has not, you will receive an error message.
- ◆ This command is valid only if the UPS module is loaded and either the type is specified or the UPS adapter driver is loaded.
- ◆ If you don’t specify the DISCHARGE and RECHARGE parameters, you are prompted for them.
- ◆ As your UPS becomes older, you may need to decrease the discharge time or increase the recharge time. Use the UPS TIME command to change these values.
- ◆ Changes made with UPS TIME aren’t reflected on the UPS status display until you run UPS STATUS or UPS TIME again.
- ◆ Changes made remain in effect until you bring down the server.

Examples

To change the discharge time to 20 minutes and the recharge time to 120 minutes, type

UPS TIME DISCHARGE=20 RECHARGE=120

Additional Information

Topic	See
Loading UPS	"UPS" (page 423).
Viewing UPS status information	"UPS STATUS" (page 426).

VERSION

Purpose

Use at the server console to view the server's version information, license information, and copyright notice.

Syntax

VERSION

Using VERSION

When you execute VERSION, a message similar to the following appears:

Novell NetWare 4.1 12/8/93

(c) Copyright 1988, 1993 Novell Inc .

All rights reserved.

Patent Pending Novell Inc.

Maximum number of License Connections: 1000

Current License Chain:

Serial Number	Connections	License Type	Version
xxxxxxxxxx	1000	MAIN	4.00
xxxxxxxxxx	1000	UPGRADE	4.1

VOLUMES

Purpose

Use at the server console to list mounted volumes.



CD-ROM volumes are not displayed by this command. For more information, see "CD" on page 24.

Syntax

VOLUMES

Using VOLUMES

When you execute VOLUMES, a message similar to the following appears:

Mounted Volumes	Name Spaces	Flags
SYS	DOS	Cp Sa Mg

The output lists each mounted volume, its name spaces, and the flags that are set for that volume. The three possible flags are:

Cp—indicates that file compression is enabled on the volume
Sa—indicates that block suballocation is enabled on the volume
Mg—indicates that migration is enabled on the volume

VREPAIR

Purpose

Use at the server console to

- ◆ Correct volume problems
- ◆ Remove name space entries from Directory tables



You can't use VREPAIR on a volume that is mounted.

Syntax

LOAD [path]VREPAIR [volume name] [log filename]

Parameter	Use to
<i>path</i>	Specify the path to VREPAIR.NLM if you moved it from the default directory.
<i>volume name</i>	Specify the name of a volume to repair.
<i>log filename</i>	Specify a text filename to log errors into.

Using VREPAIR

- ◆ See “VREPAIR Options” on page 437 for an explanation of the VREPAIR main menu.
- ◆ If a volume fails to mount when the server is brought up, VREPAIR loads automatically and tries to repair the failed volume.

If you don't want VREPAIR to automatically repair a volume that won't mount, load SERVMAN, select “Server Parameters,” and then “Miscellaneous”; then set the “Automatically Repair Bad Volume” parameter to OFF. (For more information, see “SERVMAN” on page 295.)

- ◆ Use the version of VREPAIR that matches the operating system. (You can't use a NetWare 4 version of VREPAIR on a NetWare 3 volume.)
- ◆ The majority of all problems fixed by VREPAIR are caused by hardware failures. If a volume frequently needs repair, consider replacing the hard disk or controller.



Copy VREPAIR.NLM and the VREPAIR name space support modules (*V_NAMESPACE.NLM*) to the boot partition of your server. Then, if volume SYS: fails to mount, you can load and run VREPAIR from the DOS boot directory.

How VREPAIR Works

Minor problems can occur on a volume if the primary File Allocation Table (FAT) or Directory Entry Table (DET) becomes corrupted.

VREPAIR compares the primary tables with their mirrored counterparts. (The operating system keeps two copies of all tables. If hard disks are mirrored, then four copies are kept.)

VREPAIR checks the sets of mirrored tables for errors. If it finds inconsistencies, it uses the most correct table entry as the corrected entry. VREPAIR then writes the corrected entry to both the primary and mirrored tables.

VREPAIR may have to delete some corrupted files or tables. For more information, see "Viewing Deleted Files" on page 440.

VREPAIR will log bad block information into a file if you specify a log filename when you load VREPAIR. You can also specify a log filename after you load VREPAIR, when VREPAIR displays an error.

When to Use VREPAIR

VREPAIR can repair a bad volume that you have dismounted while other NetWare server volumes are functioning. After you finish running VREPAIR, you can mount the repaired volume (in most cases).

Use VREPAIR when

- ◆ A hardware failure either prevented a volume from mounting or caused a disk read error.

Note 

Although VREPAIR can't fix hardware problems, it can sometimes fix related volume damage.

- ◆ A power failure corrupted a volume.
- ◆ The server displays memory errors and can't mount a volume after a name space (such as Macintosh) is added to the volume.

For this type of problem, either add more memory to the server or use VREPAIR to remove the newly added name space.

- ◆ The volume has bad blocks.

The following kinds of errors in FATs or Directory tables signal bad blocks:

- ◆ Read errors
- ◆ Data mirror mismatch errors
- ◆ Multiple allocation errors
- ◆ Fatal DIR errors
- ◆ Write errors

Note 

This information is reported in the log file.

VREPAIR Options

The VREPAIR main screen displays the following menu:

Options:

- 1 - Repair a volume
- 2 - Set VRepair options
- 3 - Exit

Main Menu Selection	Use to
Repair a volume	Begin or continue with volume repair. You can also use this option to stop a volume repair in process or change the method of displaying errors during the repair.
Set VRepair options	Set VREPAIR configuration options.
Exit	Exit VREPAIR.

In the “Set VREPAIR Options” menu, there are two settings for each option, a default option and an alternate option. When VREPAIR autoloads and tries to repair a volume that will not mount, the default settings are used.

You can configure the VREPAIR alternate options by selecting the associated option number to toggle between the alternate and default options.

For example, option 2 settings are “Write All Directory And FAT Entries Out To Disk” and “Write Only Changed Directory And FAT Entries Out To Disk.”

The default for option 2 is “Write Only Changed Directory And FAT Entries Out To Disk.” If you select option 2, your current VREPAIR configuration reflects the change from the default to the new setting: “Write All Directory And FAT Entries Out To Disk.”

The VREPAIR configuration options are described in Table 2-25.

Table 2-25
VREPAIR Configuration Options

Default Option	Alternate Option	Explanation
1. Quit If a VREPAIR Name Space Support NLM Is Not Loaded	Remove Name Space Support From The Volume	<p>These options control whether name space support for non-DOS files is retained in the volume tables.</p> <p>If you add a name space to a volume and the system doesn't have enough memory, select "Remove Name Space Support From the Volume." Then select a name space to delete.</p> <p>If you remove a name space, the accompanying extended file information is destroyed.</p> <p>For example, if you remove Macintosh name support, the Macintosh long names, the finder icons, and the resource forks are destroyed.</p> <p>(The DOS name and its data file are kept and are accessible from DOS workstations.)</p> <p>Important: To repair a volume with non-DOS name space entries, VREPAIR must find the corresponding name space support modules. (For example, to repair a volume with the MAC name space, you need to load V_MAC.NLM; to repair a volume with the OS/2 name space, load V_OS2.NLM.)</p> <p>For more information on removing name space entries, see "Repairing Volumes" in Chapter 7 of <i>Supervising the Network</i>.</p>

Table 2-25 *continued*
VREPAIR Configuration Options

Default Option	Alternate Option	Explanation
2. Write Only Changed Directory And FAT Entries Out To Disk	Write All Directory And FAT Entries Out To Disk	<p>These options control the changes that are made to the FATs and Directory tables.</p> <p>If you repair a mirrored or duplexed volume, select the alternate option to force an update of all tables on both hard disks.</p>
3. Write Changes Immediately To Disk	Keep Changes In Memory For Later Update	<p>NetWare 4.1 defaults to writing changes immediately to disk. In most cases, this default option speeds the repair.</p> <p>Disks requiring very few changes will repair faster if the alternate option is used.</p>
4. Retain Deleted Files	Purge All Deleted Files	<p>These options control whether deleted files are purged or retained.</p> <p>If a file is deleted, but not purged, it can be salvaged.</p> <p>Purge deleted files if you are concerned about the amount of disk space being used to retain deleted files or if you don't want users to salvage files (for example, for security reasons)</p>
5. Return to Main Menu		After you select the VREPAIR configuration options, press menu item 5 to return to the VREPAIR main menu.

Displaying Errors During Repair

There are run-time options you can modify during the VREPAIR process to change the way errors are displayed. To view the options, select the main menu option "Repair a volume."

- ◆ Select Option 1 if you do not want VREPAIR to pause after each error.
- ◆ Select Option 2 if you want VREPAIR to log errors in a text file.
- ◆ Select Option 3 to stop the repair of the volume.
- ◆ Select Option 4 to continue with a volume repair after you have temporarily suspended the repair.

Viewing Deleted Files

The repair operation can create new files containing data that VREPAIR deleted. You can access these files if you select the default configuration option "Retain Deleted Files." The files are numbered and named *VRNNNNNN.FIL* where *N* is any number.

These numbered files are created in any of the following circumstances:

- ◆ VREPAIR found a filename that is an invalid DOS name. The filename might contain invalid characters or might be too long.
- ◆ VREPAIR found that the filename is not unique. (Another file exists with the same name.)
- ◆ VREPAIR found a FAT chain without a file showing ownership of it.

Note 

A file is divided into a series of data blocks that are linked together in a FAT chain.

- ◆ No files in the Directory Entry Table (DET) claimed ownership of the data, so a new filename was generated to point to this data.

VREPAIR might create as many as several thousand of these files. These numbered files are created in the directory where they were found during the volume repair operation.

Recovering Files

You might be able to recover some or all of the files deleted by VREPAIR. Contact Technical Support for more information.

Additional Information

Topic	See
Repairing a volume or removing name space entries	“Repairing Volumes” in Chapter 7 of <i>Supervising the Network</i> .
Setting VREPAIR options	“Repairing Volumes” in Chapter 7 of <i>Supervising the Network</i> .

WHOAMI

Purpose

Use at a workstation to view connection information.

Syntax

WHOAMI [servername] [/option...] [/? | /VER]

Parameter	Use to
<i>servername</i>	Replace with the server name whose connection information you want to see.
<i>/option</i>	Replace <i>option</i> with any available option. See "WHOAMI Options" on page 444.
<i>/?</i>	View online help. All other parameters are ignored when <i>/?</i> is used.
<i>/VER</i>	View the version number of the utility and the list of files it uses to execute. All other parameters are ignored when <i>/VER</i> is used.

Using WHOAMI

WHOAMI displays the following information when no parameters are entered.

- ◆ If you are logged in to NetWare Directory Services, you see
 - ◆ The current tree name
 - ◆ Your other names
 - ◆ Your titles
 - ◆ Your description
 - ◆ Your User ID (name) on each server to which you are attached
 - ◆ The name and version information of each server
 - ◆ The server's connection number for your connection and the type of the connection (Bindery or Directory Services)
 - ◆ The date and time when you logged in to the server.
- ◆ If you are attached to a server in bindery mode, you see
 - ◆ Your workgroup manager
 - ◆ Your security equivalences
 - ◆ Groups to which you belong
 - ◆ Your bindery object's supervisor
 - ◆ Your rights to files and directories on the server

WHOAMI Options

Option	Use to
/C (Continuous)	Scroll output continuously.
/ALL (All)	View all information.
/G (Group)	View the groups you belong to (bindery).
/O (Object Supervisor)	View the supervisor of the object (bindery).
/R (Right)	View effective rights (bindery).
/S (Security Equivalences)	View security equivalences of the object (bindery).
/W (Workgroup Manager)	View the workgroup manager of the object (bindery).

Additional Information

Topic	See
Security	“Security” in <i>Concepts</i> .

WSUPDATE

Purpose

Use at a workstation to update a file on multiple drives and subdirectories.

Syntax

```
WSUPDATE [<source path> [drive letter: | volume
name:] [path\filename] [/option...]] | [/? | /VER]
```

Parameter	Use to specify
<i>source path</i>	The path of the file you are updating from, including the filename. You can't use wildcard characters.
<i>drive letter</i>	A directory to search for outdated files.
	To search all mapped drives, use the /ALL option.
	To search all local drives, use the /Local option.
<i>volume name</i>	An NDS Volume object.
	To search an NDS volume for outdated files, enter the full Volume object name relative to your current context.
	To search all mapped drives, use the /ALL option.
	To search all local drives, use the /Local option.
<i>path\filename</i>	A specific path, including the filename, so the search does not begin at the root.
<i>/option</i>	Replace <i>option</i> with any available option. See "WSUPDATE Options" on page 447.

Parameter	Use to specify
/?	View online help.
/VER	View the version number of the utility and the list of files it uses to execute.

Using WSUPDATE

- ◆ Use to update workstation files from the server.
- ◆ WSUPDATE compares the date and time of the source and destination files. If the source file is more current, WSUPDATE updates the destination file.
- ◆ If you update a file, but want to keep a copy of the old one, use the /R option.
- ◆ WSUPDATE can be run from a batch file. In that case, you may want to use options such as /L, /F, or /P.

WSUPDATE Options

Option	Use to
/ALL	Search all mapped drives. You can't specify a drive or volume with this option.
/C	Copy the new file over the old one, with no backup of the old file.
/CON	Continuously scroll the output.
/E	Erase the existing log file. Use with the /L option.
/F=[path\file]	Specify a file where the commands to update the workstation are stored. All other options are ignored when you use this option.
/LOCAL	Search all local drives. You can't specify a drive or volume with this option.

Option	Use to
/L=[path\file]	Specify the location and filename of a log file where WSUPDATE can store information. The log file can be erased with the /E option or with a DOS delete command.
/N	Create the directory specified by the destination drive and path.
/P	Get a prompt asking you whether to proceed. If there are no files to be updated, this option allows you to abort the session before it begins.
/O	Tell WSUPDATE to update all files, even those flagged Read Only.
/R	Rename the old file with an .OLD extension before copying the new file.
/S	Specify that WSUPDATE should search for the outdated files in all subdirectories of the destination path.
/V[=path]	<p>Update the CONFIG.SYS file in the root directory of the C: drive with the string LASTDRIVE=Z. Your old CONFIG.SYS file is renamed to CONFIG.VLM. If your CONFIG.SYS file is not in the root of drive C:, then type the path up to, but not including, the filename.</p> <p>If the CONFIG.SYS file already has a LASTDRIVE= parameter, it is replaced with LASTDRIVE=Z.</p> <p>If your CONFIG.SYS file doesn't have a LASTDRIVE= parameter, WSUPDATE will add one.</p>

Examples

- ◆ To search all mapped drives and copy over old NET5.COM files, type

WSUPDATE VOL:SYSTEM\NET5.COM /ALL /C

- ◆ To search local drives and rename the old NET5.COM files, type

WSUPDATE VOL:SYSTEM\NET5.COM /LOCAL /R

- ◆ To specify source instruction file, type

WSUPDATE /F=C:\INFILE.UPD

- ◆ To copy all files with the .VLM extension to the new directory C:\VLM, type

WSUPDATE *.VLM C:\VLM /N

- ◆ To update the CONFIG.SYS file in the root of drive C:, type

WSUPDATE /V

- ◆ To update the CONFIG.SYS file in the ODI directory on drive C:, type

WSUPDATE /V C:\ODI

Additional Information

Topic	See
Using WSUPDATE in login scripts	"Using the WSUPDATE Utility" in Appendix A of <i>NetWare Client for DOS and MS Windows User Guide</i> .

WSUPGRD

Purpose

Use at a workstation to upgrade the IPX LAN driver on the workstation to the corresponding ODI driver.

Syntax

WSUPGRD [*path*] [/option...] [/? | /VER]

Parameter	Use to
<i>path</i>	Specify the path to and including the existing IPX driver name. Default: \IPX.COM.
/option	Replace <i>option</i> with any available option. See “WSUPRD Options” on page 451.
/?	View online help. All other parameters are ignored when /? is used.
/VER	View the version number of the utility and the list of files it uses to execute. All other parameters are ignored when /VER is used.

WSUPGRD Options

Option	Use to
/C	<p>Cause the utility to exit with error level 1 if no upgrade is performed.</p> <p>By default, the utility exits with no error code whether or not an upgrade is performed.</p> <p>This allows a batch file to conditionally perform other upgrade actions.</p> <p>If an error occurs, the utility exits with an error level 3, whether or not /C is specified</p>
/N	<p>Cause the utility to not delete the IPX driver.</p> <p>By default the old driver is deleted before the ODI driver is installed.</p> <p>Note: If /N is specified and the ODI driver has the same name as the IPX driver, the former will overwrite the latter—deleting it even if /N is specified.</p>
/E0 E1 E2	<p>Control the changes that the utility makes to the AUTOEXEC.BAT file.</p> <p>Default: E2.</p> <p>E0: Specify that no changes be made to the AUTOEXEC.BAT file.</p> <p>E1: Specify that the line which loads the IPX driver is to be deleted (if it is present) from the AUTOEXEC.BAT file and replaced by lines to load the LSL, ODI driver, and the IPX driver.</p> <p>E2: Specify that the line that loads the IPX driver is to be deleted (if present) from the AUTOEXEC.BAT file and replaced by a call to a new batch file called NWSTART.BAT which is to be created to load the LSL, the ODI driver, and IPX.</p>

Option	Use to
/S	<p>Suppress the generation of a NET.CFG file from the information in the IPX driver's configuration table.</p> <p>Note: A NET.CFG file may be generated even if this switch is present if an LDC file is present with the ODI driver.</p>
/I	<p>Cause the utility to print out the hardware ID in the master configuration table of the ODI driver.</p> <p>You cannot use this option with any other option.</p> <p>If this switch is specified, no upgrade is performed and thus no other switches are allowed.</p>

Examples

- ◆ To save the IPX driver and update the AUTOEXEC.BAT file, type

WSUPGRD NE2000 /N /E1

- ◆ To print out the hardware ID, type

WSUPGRD NE2000 /I

- ◆ To specify the location of the IPX driver for upgrading, type

WSUPGRD NE2000 c:\NE2000.COM

Additional Information

Topic	See
Using WSUPGRD in login scripts	"Using the WSUPGRD Utility" in Appendix B of <i>NetWare Client for DOS and MS Windows User Guide</i> .



appendix

A

NDS and Bindery Objects and Properties

NDS Object Classes and Properties

- ◆ “NDS Object Classes” on page 456 lists each NDS object class, explains what it is used for, and indicates where that type of object can be created.
- ◆ “NDS Object Classes and Their Properties” on page 458 lists each NDS object and properties associated with it.
- ◆ “Bindery Objects, Their Properties, and Property Groups” on page 464 lists each bindery object and properties associated with it.

NDS Object Classes

Object class	What this object is used for	Objects that contain this object
AFP Server		Organization Organizational Unit
Alias	Redirects the path of a branch or leaf of the Directory tree in another location for more convenient access	Organization Organizational Unit Root level
Bindery Object	Represents an object that was upgraded from a bindery-based server, but that cannot be identified	Organization Organizational Unit
Bindery Queue		
Computer	Represents computers on the network that are not file or print servers, such as gateways, routers, and sometimes workstations	No containment restrictions at the root level
Country	Defines countries in the Directory tree to help organize objects	Must be at root level
Directory Map	Specifies a path on a volume that points to a frequently used directory for an application	Organization Organizational Unit

Object class	What this object is used for	Objects that contain this object
Group	Defines an unordered list of users that comprise a group for purposes of assigning access rights	Organization Organizational Unit
NetWare Server	Represents a server that provides file and other services	Organization Organizational Unit
Organization	Defines an organization within the network	Country or root level
Organizational Role	Defines a position or role within an organization for the purpose of assigning access rights	Organization Organizational Unit
Organizational Unit	Defines a subdivision within an organization to contain objects	Organization Organizational Unit
Print Server	Represents a network print server	Organization Organizational Unit
Printer	Represents a physical printing device on the network	Organization Organizational Unit
Profile	Specifies a login script that is used by several users not located in the same container	Organization Organizational Unit
Queue	Represents a batch processing queue for printing on the network	Organization Organizational Unit

Object class	What this object is used for	Objects that contain this object
User	Represents a user on the network	Organization Organizational Unit
Volume	Represents a physical volume within a NetWare file server	Organization Organizational Unit

NDS Object Classes and Their Properties

Object	Properties	
AFP Server	CN Object Class Serial Number Supported Connections Descriptions Host Device L OU O Private Key	Public Key Resource See Also Status User Version Network Address ACL Back Link Bindery Property
Alias	Aliased Object Name Object Class ACL	Back Link Bindery Property
Bindery Object	Bindery Object Restrictions Bindery Type CN Object Class	ACL Back Link Bindery Property

Object	Properties	
Bindery Queue	CN	Volume
	Bindery Type	Description
	Queue Directory	Host Resource Name
	Host Server	L
	Object Class	OU
	Device	O
	Operator	See Also
	Server	ACL
	User	Back Link
	Network Address	Bindery Property
Computer	CN	OU
	Object Class	O
	Operator	Owner
	Server	See Also
	Status	Serial Number
	Description	ACL
	L	Back Link
	Network Address	Bindery Property
	C	ACL
Country	Object Class	Back Link
	Description	Bindery Property
Directory Map	CN	OU
	Host Server	O
	Object Class	See Also
	Path	ACL
	Description	Back Link
	Host Resource	Bindery Property
	Name	
	L	
Group	CN	Owner
	Object Class	See Also
	Description	GID
	L	ACL
	Member	Back Link
	OU	Bindery Property
	O	

Object	Properties	
NCP Server	CN Object Class Operator Supported Services Description Host Device L OU O Private Key	Public Key Resource See Also Status User Version Network Address ACL Back Link Bindery Property
Organization	O Object Class Description Facsimile Telephone Number L Login Script EMail Address Physical Delivery Office Name Postal Address Postal Code Postal Office Box Print Job Configuration Printer Control	See Also S SA Telephone Number Login Intruder Limit Intruder Attempt Reset Interval Detect Intruder Lockout After Detection Intruder Lockout Reset Interval ACL Back Link Bindery Property
Organizational Role	CN Object Class Description Facsimile Telephone Number L EMail Address OU Physical Delivery Office Name Postal Address	Postal Code Postal Office Box Role Occupant See Also S SA Telephone Number ACL Back Link Bindery Properly

Object	Properties	
Organizational Unit	OU Object Class Description Facsimile Telephone Number L Login Script EMail Address Physical Delivery Office Name Postal Address Postal Code Postal Office Box Print Job Configuration Printer Control	See Also S SA Telephone Number Login Intruder Limit Intruder Attempt Reset Interval Detect Intruder Lockout After Detection Intruder Lockout Reset Interval ACL Back Link Bindery Property
Print Server	CN Object Class Operator Print SAP Name Description Host Device L OU O Private Key	Public Key Resource See Also Status User Version Network Address ACL Back Link Bindery Property
Printer	CN Object Class Cartridge Printer Configuration Default Queue Host Device Print Server Memory Network Address Restrictions Notify Operator Page Description Language Queue	Status Supported Typefaces Description L Network Address OU O Owner See Also Serial Number ACL Back Link Bindery Property

Object	Properties	
Profile	CN	O
	Login Script	See Also
	Object Class	ACL
	Description	Back Link
	L	Bindery Property
	OU	
Queue	Queue Directory	Description
	CN	Host Resource Name
	Host Server	L
	Object Class	OU
	Device	O
	Operator	See Also
	Server	ACL
	User	Back Link
	Network Address	Bindery Property
Unknown	Volume	
	Unknown Object	ACL
	Restriction	Back Link
	Object Class	Bindery Property

Object	Properties
User	CN Surname Object Class Group Membership Home Directory Login Allowed Time Map Login Disabled Login Expiration Time Login Grace Limit Login Grace Remaining Login Intruder Address Login Intruder Attempts Login Maximum Simultaneous Login Script Login Time Network Address Restrictions Network Address Passwords Used Password Allow Change Password Expiration Interval Password Expiration Time Password Minimum Length Password Required Password Unique Required Print Job Configuration Private Key Public Key Security Equals
	Account Balance Allow Unlimited Credit Minimum Account Balance Message Server Language UID Locked By Intruder Server Holds Last Login Time Type Creator Map Facsimile Telephone Number L EMail Address OU Physical Delivery Office Name Postal Address Postal Code Postal Office Box S SA Title Description See Also Telephone Number ACL Back Link Bindery Property

Object	Properties	
Volume	CN	OU
	Host Server	O
	Object Class	See Also
	Status	ACL
	Description	Back Link
	Host Resource	Bindery Property
	Name	
	L	

Bindery Objects, Their Properties, and Property Groups

Object	Properties	Property Groups
Group	Name	(All Groups)
	Description	Misc
	Managers	Managers
	Member	Members
	Object ID	Misc
Queue	Name	(All Groups)
	Directory	Directory
	Object ID	Misc
	Operators	Operators
	Servers	Servers
	Users	Users
Server	Name	(All Groups)
	Attachment Status	Misc
	Object ID	Network
	Network	Network
	Node	Attachment
	Version	Information
	Accounting Installed	Attachment
	Maximum Volumes	Information
	Maximum	Attachment
	Connections	Information
	Connections In Use	Attachment
		Information
		Attachment
		Information
		Attachment

Object	Properties	Property Groups
User	Name Network Node Connection Number Login Time Object ID Account Disabled Account Expiration Date Password Allow Change Password Required Password Force Change Password Expiration Days Password Expiration Date Password Length Unique Password Grace Logins Grace Logins Remaining Maximum Connections Last Login Groups Managers Security Equals	Misc Misc Misc Misc Misc Misc Login Control Login Control Groups Managers Security Equals
Volume	Name Server	(All Groups) Server



appendix

B *LAN Driver Statistics*

Monitoring Network Traffic

By comparing information about LAN drivers installed on your server, you can tell which cabling system is handling the most traffic.

If errors occur frequently on a high-traffic system, you may want to switch some of the stations on the busy system to a new or less busy cabling system.

For information on how to view LAN driver statistics, see “Viewing LAN Driver Statistics” in Chapter 7 of *Supervising the Network*.

Common LAN Driver Statistics

The generic statistics common to most of the drivers are maintained by two modules in NetWare that are autoloaded by LAN drivers. The modules are:

- ◆ The Media Support Module™ (MSM.NLM)
- ◆ The Topology Specific Module™ (TSM.NLM)

There are four TSMs. The one that is autoloaded will depend on your server’s LAN driver. The four are: ETHERTSM (Ethernet), RXNETTSM (ARCnet), TOKENTSM (token ring), and FDDITSM.

For more information on the MSM and the TSMs, see “Open Data-Link Interface” in *Concepts*.

These common LAN driver statistics can be viewed with MONITOR. Select the “LAN/WAN Information” option from the MONITOR menu, and then select a driver. The system displays a window containing both the generic and custom statistics for the selected driver.

Brief descriptions of the statistics maintained by the MSM and each of the TSMs are found in the following tables:

- ◆ Table B-1, “LAN Driver Statistics,” on page 469
- ◆ Table B-2, “Generic Statistics for Ethernet Drivers That Use ETHERTSM.NLM,” on page 473
- ◆ Table B-3, “Generic Statistics for RX-Net Drivers That Use RXNETTSM.NLM,” on page 474
- ◆ Table B-4, “Generic Statistics for Token Ring Drivers That Use TOKENTSM.NLM,” on page 475
- ◆ Table B-5, “Generic Statistics for FDDI Drivers That Use FDDITSM.NLM,” on page 477

Custom LAN Driver Statistics

Custom statistics describe LAN activity for specific LAN device drivers.

The custom LAN driver statistics can be viewed with MONITOR. Select the “LAN/WAN Information” option from the MONITOR menu, and then select a driver. The system displays a window containing both the generic and custom statistics for the selected driver.

Brief descriptions of statistics for selected drivers are found in the following tables:

- ◆ Table B-6, “Custom Statistics for NE2000, NE2, NE2_32, NE1000, and Other Ethernet Drivers,” on page 478
- ◆ Table B-7, “Custom Statistics for Token Ring Drivers,” on page 487
- ◆ Table B-8, “Custom Statistics for IBM Baseband PCN2L Drivers,” on page 489

Custom statistics vary, depending on the LAN driver installed. For statistical information about third-party drivers, check the documentation that comes with the driver.

If your network board is not listed in the custom statistics section, contact the manufacturer of the board and its driver for custom statistics documentation.

Table B-1
LAN Driver Statistics

Statistic	Description
Driver Name	The driver name and parameters that correspond to the hardware settings on the network board.
Version	The current version of the driver.
Node Address	The station or node address of the network board in the NetWare server.
Protocols	The communication protocols bound to the driver with BIND.
Network Address	The network number assigned to the cabling system the LAN driver is operating on. Appears only if the IPX protocol has been bound to the board.
Total Packets Sent	<p>The number of packets sent from the NetWare server through this LAN driver since the server was last booted.</p> <p>(By comparing this figure with the figures for other LAN drivers, you can see which driver is handling the most traffic.)</p> <p>This value is maintained by the Topology Specific Module (TSM).</p>
Total Packets Received	<p>The number of packets received by the NetWare server since it was last booted. This includes file service requests, packets routed to another network, and packets sent to other IPX sockets in the NetWare server.</p> <p>This value is maintained by the TSM.</p>

Table B-1 *continued*
LAN Driver Statistics

Statistic	Description
No ECB Available Count	<p>A counter that is incremented when a device sends a packet to your NetWare server, but no packet receive buffer is available.</p>
	<p>The server allocates more packet receive buffers after each incident until it reaches its maximum limit (configured with a SET parameter).</p>
	<p>If you are using an EISA or microchannel bus-master board (such as the NE3200), you will probably need to increase both the minimum and maximum number of packet receive buffers.</p>
	<p>See "Minimum Packet Receive Buffers" and "Maximum Packet Receive Buffers" in "SET" on page 299.</p>
	<p>No ECB Available Count messages can also indicate that the driver is not configured correctly or that the TSM and the Hardware Specific Module™ (HSM) are incompatible.</p>
	<p>This value is maintained by the TSM.</p>
Send Packet Too Big Count	<p>A counter that is incremented when the NetWare server tries to transmit a packet that is too large for the hardware to handle.</p>
	<p>This value is maintained by the TSM.</p>
Reserved	<p>This field is not currently used.</p>
Receive Packet Overflow Count	<p>The LAN driver uses this counter to indicate the number of times the adapter's receive buffers overflowed, causing subsequent incoming packets to be discarded.</p>
	<p>This value is a counter that is incremented when the NetWare server receives a packet that is too big to store in a cache buffer.</p>
	<p>This happens rarely, unless you are running a software program that does not negotiate packet size. Contact the vendor for an updated version of the software.</p>
	<p>This value is maintained by the HSM.</p>

Table B-1 *continued*
LAN Driver Statistics

Statistic	Description
Receive Packet Too Big Count	A counter that is incremented when the NetWare server receives a packet that is too big for the provided receive buffers.
Receive Packet Too Small Count	A counter that is incremented when the NetWare server receives a packet that is too small. Currently only the RX-Net TSM maintains this counter.
Send Packet Miscellaneous Errors	A counter that is incremented when errors with send packets occur.
Receive Packet Miscellaneous Errors	A counter that is incremented when errors with receive packets occur. This value is maintained by the HSM.
Send Packet Retry Count	A counter that is incremented when the NetWare server tries to send a packet but fails because of a hardware error. The server tries to send the packet until either it succeeds or the retry setting is reached. This value is maintained by the HSM.
Checksum Errors	A counter that is incremented when the checksum byte at the end of the packet does not match the sum of the bytes contained in the packet. This indicates a data error. This value is maintained by the HSM.
Hardware Receive Mismatch Count	A counter that is incremented when the packet length received by the hardware and the length specified by the packet do not match. Currently only the Ethernet Topology Specific Module (TSM) maintains this counter.
Total Send OK Byte Count Low	The number of bytes, including low-level headers, successfully transmitted. This value is maintained by the Media Support Module (MSM).

Table B-1 *continued*
LAN Driver Statistics

Statistic	Description
Total Send OK Byte Count High	Upper 32 bits of the Total Send OK Byte Count Low. The Total Send OK Byte Count High statistic is incremented to 1 when the Total Send OK Byte Count Low counter reaches 4 GB. This value is maintained by the MSM.
Total Receive OK Byte Count Low	The number of bytes, including low-level headers, successfully received. This value is maintained by the MSM.
Total Receive OK Byte Count High	Upper 32 bits of the Total Receive OK Byte Count Low. The Total Receive OK Byte Count High statistic is incremented to 1 when the Total Receive OK Byte Count Low value reaches 4 GB. This field is maintained by the MSM.
Total Group Address Send Count	The number of packets transmitted with a group or multicast destination address. This field is maintained by the MSM.
Total Group Address Receive Count	The number of packets received with a group or multicast destination address. This field is maintained by the MSM.
Adapter Reset Count	The number of times the adapter was reset because of internal failures or other calls to the Driver Reset routine. This field is maintained by the HSM.
Adapter Operating Time Stamp	The time stamp indicating when the adapter last changed operational state (such as load, shutdown, or reset). This value is maintained by the MSM.
Adapter Queue Depth	The number of transmit packets (transmit ECBs) that are queued for the adapter. This is an indication of throughput overload on transmits. This field is maintained by the TSM.

Table B-2**Generic Statistics for Ethernet Drivers That Use ETHERTSM.NLM**

Statistic	Description
Send OK Single Collision Count	<p>The number of frames involved in a single collision that are subsequently transmitted successfully.</p> <p>When the Ethernet controller detects a collision, it backs off and then retries the transmission.</p>
Send OK Multiple Collision Count	<p>The number of frames involved in more than one collision that are transmitted successfully.</p> <p>This happens if the Ethernet controller had to back off more than once due to collisions.</p>
Send OK But Deferred	<p>The number of frames whose transmission was delayed because of a busy medium.</p> <p>This happens if another station is transmitting on the wire when the adapter receives the command to transmit a packet.</p>
Send Abort From Late Collision	<p>The number of transmits that had a collision after 512 bits of the packet were transmitted.</p> <p>This can be caused by faulty adapters, faulty network equipment, cables that are too long, or faulty terminators.</p>
Send Abort From Excess Collisions	<p>The number of transmits that were aborted because of too many collisions.</p> <p>This usually indicates that a board in the network is bad or jabbering. (Jabbering means the board has been on the channel longer than the time needed to transmit the maximum size packet.)</p> <p>This condition could also occur in very heavy traffic conditions.</p>
Send Abort From Carrier Sense	<p>The number of transmits aborted because of loss of carrier sense while transmitting without any collisions.</p> <p>This is usually caused by a faulty adapter in the network, faulty cabling, an unterminated cable, or a faulty repeater.</p>

Table B-2 *continued***Generic Statistics for Ethernet Drivers That Use ETHERTSM.NLM**

Statistic	Description
Send Abort From Excessive Deferral	<p>The number of transmits aborted because of excessive deferrals.</p> <p>This is usually caused by a faulty adapter or repeater in the system that is jabbering on the wire.</p> <p>It can also occur under very heavy traffic conditions.</p>
Receive Abort From Bad Frame Alignment	<p>The number of received frames that were misaligned.</p> <p>This occurs when the number of octets in the frame is not correct or the frame does not pass the FCS check.</p> <p>These bad packets are usually caused by a faulty adapter or repeater in the system. They can also be caused by a collision.</p>

Table B-3**Generic Statistics for RX-Net Drivers That Use RXNETTSM.NLM**

Statistic	Description
NoResponseToFreeBufferEnquiry	A counter that is incremented each time there is no response from the receiving node to a Free Buffer Enquiry.
NetworkReconfigurationCount	A counter that is incremented each time a Network Reconfiguration occurs.
InvalidSplitFlagInPacketFlag	<p>A counter that is incremented each time the Split Flag in the packet fragment is not the value expected.</p> <p>Packet fragments received out of order can cause this value to increase.</p>
OrphanPacketFragmentCount	A counter that is incremented each time a packet fragment is received that is not a part of a previously received packet and therefore cannot be appended.
ReceivePacketTimeout	A counter that is incremented each time a received packet times out while waiting for the rest of the packet fragments to arrive.

Table B-3 *continued***Generic Statistics for RX-Net Drivers That Use RXNETSM.NLM**

Statistic	Description
FreeBufferEnquiryNAKTimeout	A counter that is incremented each time a transmit packet times out while waiting for an acknowledgment to a Free Buffer Enquiry from the receiving node.
TotalSendPacketFragmentsOK	<p>A counter that is incremented each time a packet fragment is sent successfully.</p> <p>This number is high because packets are made up of multiple fragments.</p> <p>For example a 4-KB packet is actually eight 512-byte packet fragments.</p>
TotalReceivePacketFragmentsOK	<p>A counter that is incremented each time a packet fragment is received successfully.</p> <p>This number is high because packets are made up of multiple fragments.</p> <p>For example a 4-KB packet is actually eight 512-byte packet fragments.</p>

Table B-4**Generic Statistics for Token Ring Drivers That Use TOKENTSM.NLM**

Statistic	Description
AC Error Counter	This counter is incremented when a ring station receives a "Standby Monitor Present" MAC frame with the A/C bits in the Frame Status field equal to zero without first receiving an "Active Monitor Present" MAC frame.
Abort Delimiter	<p>This counter is incremented when a ring station transmits an abort delimiter.</p> <p>An abort delimiter is transmitted when a ring station receives a frame in which the token bit of the access control field is set to show "Token" and not "Frame."</p> <p>A ring station can also transmit an abort delimiter if an internal hardware error has occurred.</p>

Table B-4 *continued***Generic Statistics for Token Ring Drivers That Use TOKENTSM.NLM**

Statistic	Description
Burst Error Counter	This counter is incremented when a ring station detects the absence of "five half-bit times" (a burst-five error). Other stations will detect a burst-four error followed by idles.
Frame Copied Error Counter	This counter is incremented when a ring station recognizes (receives or repeats) a frame addressed to its specific address and detects that the FC field A bits are set to 1, indicating a possible line hit or a duplicate address.
Frequency Error Counter	This counter is incremented when the frequency of the incoming signal differs from the expected frequency by more than that specified in Section 7 of IEEE Standard 802.5-1989.
Internal Error Counter	This counts the times a ring station has a recoverable internal error, which means a ring station is probably marginal.
Last Ring Status	This code changes each time the ring status changes. Status codes are reported by the physical hardware. See the <i>IBM Token-Ring Network Architecture Reference</i> for the status code, function, and meaning.
Line Error Counter	This counter is incremented when a frame or token is repeated by the ring station. A frame is repeated when a Frame Check Sequence error occurs or a code violation exists between the starting and ending delimiters of the frame.
Lost Frame Counter	This counter is incremented when a ring station transmits a frame that does not return to the station. The active monitor sends a new token.
Token Error Counter	This counter is incremented when a station acting as the active monitor recognizes an error condition that needs a token transmitted. This occurs when the TVX timer expires.
Up Stream Node High Dword	The first eight digits of the Up Stream node address of the next node up stream on the ring.

Table B-4 *continued***Generic Statistics for Token Ring Drivers That Use TOKENTSM.NLM**

Statistic	Description
Up Stream Node Low Dword	The next four digits of the Up Stream node address of the next node up stream on the ring.
Last Ring ID	This contains the value of the local ring ID.
Last Beacon Type	This contains the value of the last beacon type.

Table B-5**Generic Statistics for FDDI Drivers That Use FDDITSM.NLM**

Statistic	Description
Configuration State	The attachment configuration for the station or concentrator: 0=isolated; 1=local_a; 2=local_b; 3=local_ab; 4=local_s; 5=wrap_a; 6=wrap_b; 7=wrap_ab; 8=wrap_s; 9=c_wrap_a; 10=c_wrap_b; 11=c_wrap_s; 12=thru
Upstream Node Address	The upstream neighbor's MAC address (0 if unknown).
Downstream Node Address	The downstream neighbor's MAC address (0 if unknown).
Frame Error Counter	The number of frames that were detected in error by this MAC that had not been detected in error by another MAC.
Frames Lost Counter	The number of instances that this MAC detected a format error during frame reception such that the frame was stripped.
Ring Management State	Indicates the current state of the Ring Management state machine: 0=Isolated; 1=Non_Op; 2=Ring_Op; 3=Detect; 4=Non_Op_Dup; 5=Ring_Op_Dup; 6=Directed; 7=Trace
LCT Failure Counter	The count of the consecutive times the link confidence test (LCT) has failed during connection management.
LEM Link Reject Counter	The link error monitor (LEM) count of the times that a link was rejected
LEM Error Counter	The aggregate link error monitor (LEM) error count.

Table B-5 *continued***Generic Statistics for FDDI Drivers That Use FDDITSM.NLM**

Statistic	Description
Connection State	The state of this port's Physical Connection Management (PCM) state machine: 0=Off; 1=Break; 2=Trace; 3=Connect; 4=Next; 5=Signal; 6=Join; 7=Verify; 8=Active; 9=Maint

Table B-6**Custom Statistics for NE2000, NE2, NE2_32, NE1000, and Other Ethernet Drivers**

Statistic	Description
UnderrunErrorCount	This counter is incremented when the RAM buffer on the network board is full; the board cannot accept any more packets until the RAM buffer is cleared.
TransmitTimeoutCount	This counter is incremented when a network board interrupts the file server with the message that the send bit is lost.
	This is a hardware problem caused by faulty cabling, a bad network board, or a missing terminator.
RxPagingErrorCount	This is a count of the errors that occur when internal buffers on the card are corrupted.
ReceiveFIFOOverflowErrorCount	This counter is incremented when an incoming packet causes an overflow because FIFO was not serviced.
ReceiverMissedPacketCount	This counter is incremented when a packet is sent to a network board that cannot accept the packet because all its receive buffers are full.
GotNothingCount	This counter is incremented when the file server receives an interrupt from a network board that is not transmitting or receiving anything.
	This is not serious.
UnsupportedFramePacketCount	This counter is incremented when a packet is received by the LAN driver with a frame type that hasn't been loaded for the given board.

Table B-6 *continued***Custom Statistics for NE2000, NE2, NE2_32, NE1000, and Other Ethernet Drivers**

Statistic	Description
UnsupportedMulticastCount	This counter is incremented for each multicast packet received by the board that is not registered with the driver.
BackToBackSendCount	This counter is incremented each time the driver can buffer a send packet onto the network board while the board is sending a previous buffer. Use this counter to track congestion on the network board. See also “EnqueuedSendsCount.”
EnqueuedSendsCount	This counter is incremented when the driver is unable to transmit a packet and must put the packet in a queue until the transmitter is available. Use the counter to track congestion on the network board. See also “BackToBackSendCount.”
In32BitModeCount	(NE1000 only) This counter is incremented if a network board is ever found in 32-bit mode. (Currently, workstations run in 8-bit mode.) Occasionally, older NE1000 boards have bad chips that make the boards go into 32-bit mode. If this counter is ever incremented, there is probably an older board on the network.
HeartBeatError	(NE2100 or NE1500T) This counter is incremented when there is a signal quality error. This function is also known as the heartbeat or Signal Quality Error (SQE) test. This counter indicates a hardware problem.
MemoryTimeout	(NE2100 or NE1500T) This counter is incremented when there is contention on the bus. If this counter is incremented, there may be multiple boards in the server or another bus-mastering device in the server, such as a LAN or disk channel device.

Table B-6 *continued*

Custom Statistics for NE2000, NE2, NE2_32, NE1000, and Other Ethernet Drivers

Statistic	Description
TxBabblingError	<p>(NE2100 or NE1500T) This counter is incremented when there is excessive length in the transmit buffer.</p> <p>It will increment after 1519 data bytes have been transmitted from the buffer.</p> <p>It indicates that the transmitter has been on the channel longer than the time required to send the maximum length packet.</p> <p>If this counter is incremented, it indicates a hardware problem with the network interface card in the server.</p>
TxUnderflowError	<p>(NE2100 or NE1500T) This counter is incremented when something else on the bus takes control of the bus while the LAN driver is putting the data on the wire.</p> <p>If this occurs, the packet must be retransmitted.</p>
TXBufferError	<p>(NE2100 or NE1500T) This counter is incremented when there is a problem with the transmit buffer.</p> <p>This counter is usually incremented when TxUnderflowError is incremented; it indicates a hardware problem in the server.</p>

Table B-6 *continued***Custom Statistics for NE2000, NE2, NE2_32, NE1000, and Other Ethernet Drivers**

Statistic	Description
RxECBsOver16MegCount	(NE2100 or NE1500T) One of these counters is incremented when either a transmit or receive occurs and the driver has double buffered the ECB in the reserved buffers below 16 MB in memory.
TxECBsOver16MegCount	These boards require double buffering because they have a physical limitation that prevents them from accessing memory above 16 MB. Therefore, if the operating system issues an Event Control Block (ECB) with a memory address above 16 MB, the board uses some of the reserved buffers below 16 MB to queue the request.
	These are not errors. This value tracks how many ECBs are redirected to the buffers below 16 MB.
	In many cases, this counter can be as high as the total packets sent and received. This double buffering decreases performance.
	If you have more than 16 MB of RAM and a board that is bus-mastering or using DMA that is not a 32-bit adapter, performance may be degraded.
PacketUsed2ECBs	(NE2100 or NE1500T) This counter is incremented if the Server Maximum Physical Receive Packet Size is set to 1514 bytes (default for NetWare 3.11 servers), and you need to receive a near-full-size packet In this instance, two ECBs are used instead of one, since the CRC on the end of the packet requires an extra four bytes. Using two ECBs instead of one may decrease performance slightly.
	Note: For Netware 3.12 and 4.x the default Maximum Physical Receive Packet Size is 4202.
TransmitRetryFailure	(NE3200) This counter is incremented when the driver is unable to transmit a packet after a specified number of times. This may indicate a hardware problem.

Table B-6 *continued***Custom Statistics for NE2000, NE2, NE2_32, NE1000, and Other Ethernet Drivers**

Statistic	Description
TxClearToSendsErrors	<p>(NE3200) This counter tracks an 82586 error.</p> <p>There are some conditions when the Clear to Send signal from the 82586 chip is incorrect.</p> <p>This counter indicates the number of times the corrective code on the adapter was executed to work around this condition in the 82586.</p>
TxDMAUnderrunErrors	<p>(NE3200) This counter tracks an 82586 error.</p> <p>Contention among the BMIC, 80186, and 82586 can occur on the adapter, causing the 82586 to assume it did not receive all of the packet for transmission. The transmit operation must then be retried.</p> <p>This counter indicates the number of times the corrective code on the adapter was executed to work around this condition.</p>
RxDMAOverrunErrors	<p>(NE3200) This counter tracks an 82586 error.</p> <p>If two packets are received back-to-back at close to 9.6 microseconds (the minimum Ethernet interframe spacing), then the chip may report an overrun.</p> <p>If so, the frames are lost by the chip and the source must retransmit.</p> <p>This counter indicates the number of times this error has occurred.</p>
RxPacketSlideErrors	<p>(NE3200) This counter tracks the number of instances of an 82586 anomaly.</p> <p>In some conditions, the 82586 may be off by two bytes in the receive packet descriptors. In this case, the sending station must retransmit the packet.</p> <p>This counter indicates the number of times this condition has occurred.</p>

Table B-6 *continued***Custom Statistics for NE2000, NE2, NE2_32, NE1000, and Other Ethernet Drivers**

Statistic	Description
RxDummyRCBUsedErrors	<p>(NE3200) This counter tracks an 82586 error.</p> <p>In some cases, the 82586 may attempt to receive data into a nonexistent receive buffer at the end of its receive buffer list.</p> <p>To catch this condition and avoid internal data corruption, a dummy receive buffer is added to the end of the list.</p> <p>This variable counts the number of times the 82586 attempted to write into the dummy buffer.</p>
InternalAdapterReset	<p>(NE3200) This counts the number of resets (by the 80186) that occurred on the adapter due to failures on the adapter.</p> <p>This counter is incremented when the software corrects itself for minor problems or if the adapter is in an unknown state.</p> <p>It is common for this counter to be incremented.</p> <p>Under normal conditions, more of these errors should occur during idle time than when the driver is busy.</p> <p>This counter would only indicate a hardware problem if it registered thousands of these errors when the network is busy.</p>
MondoFragmentLengthErrors	<p>(NE3200) This counter tracks the number of instances in which an NLM on the server has passed the NE3200 driver an ECB whose logical memory address could not be translated to a physical memory address.</p> <p>You should check other NLMs on the system and upgrade them.</p> <p>If you are still experiencing problems, identify which NLM is causing the problem and contact the third-party manufacturer of the NLM.</p>
PollingTimeout	<p>(NE3200) This counter tracks the number of times the adapter's request was put on the queue but was not serviced within 800 nanoseconds (default).</p> <p>After this occurs, the adapter fires an interrupt.</p>

Table B-6 *continued***Custom Statistics for NE2000, NE2, NE2_32, NE1000, and Other Ethernet Drivers**

Statistic	Description
ResetBecauseHardwareDiedError	(NE3200) If the adapter is in an unknown state or stops transmitting on the host side, the driver increments this counter and resets or restarts the adapter.
NumberOfInterruptsFired	(NE3200) This counter is incremented each time the adapter had to fire an interrupt to service a request because the polled request wasn't serviced.
FIFOUnderRunCount	(NE32HUB) This counter is incremented during high utilization or high bus usage if a packet cannot be sent. This event should rarely occur.
ByteCountMismatchCount	(NE32HUB) This counter is incremented when the transmit packet size is not equal to the sum of fragments passed to the SONIC chip on the board. This event should rarely occur.
HardTransmitErrorCount	(NE32HUB) This counter is incremented when a CRC, Excessive Deferral, ByteCount MismatchCount, or FIFOUnderRunCount occurs on a transmit. This is a general transmit error counter.
TransmitCollisionsCount	(NE32HUB) This counter is incremented when the board can't transmit on the wire. If the board requires five tries to transmit the packet, this counter is incremented by 4.
OutOfWindowCollisionCount	(NE32HUB) This counter is incremented when an illegal collision occurs. Collision should normally occur during the preamble. This counter is incremented if the collision occurs after the preamble. This event should rarely occur.
CRCErrorCount	(NE32HUB) This counter is incremented when a packet with a bad CRC is received by the card.

Table B-6 *continued***Custom Statistics for NE2000, NE2, NE2_32, NE1000, and Other Ethernet Drivers**

Statistic	Description
FIFOOverrunCount	<p>(NE32HUB) This counter is incremented when a packet with errors is received.</p> <p>The driver looks at the FIFO overrun counter to determine if there are errors.</p> <p>If there are errors, the packet is thrown away.</p>
RDAExhaustCount	<p>(NE32HUB) This counter is incremented when the driver can't take the data out of the buffer fast enough to process it, and the Receive Descriptor Area has overflowed.</p> <p>This should not happen very often, but it is more likely under high utilization.</p>
RRAExhaustCount	<p>(NE32HUB) This counter is incremented when the driver can't take the data out of the buffer fast enough to process it, and the Receive Resource Area has overflowed.</p> <p>This shouldn't occur very often, but it is more likely to occur during high usage.</p>
RBAExceedCount	<p>(NE32HUB) This counter is incremented when the driver can't take the data out of the buffer fast enough to process it, and the Receive Buffer Area has overflowed.</p> <p>This shouldn't occur very often, but is more likely to occur during high usage.</p>
FlagFoundCount	(NE32HUB) This counter is incremented when the RIC chip on the adapter reports an error such as Jabber, Out of Window Collision, etc.
PacketsCompressedCount	<p>(NE32HUB) This counter is incremented when the driver is in promiscuous mode and is looking at every packet.</p> <p>To get management information efficiently, the driver copies only the first 50 bytes of the packet into the buffer and then adds the 7 bytes of management information to the end of the packet.</p> <p>This occurs only on the packets that are not destined for the server when the driver is loaded with PCOMP=ENABLE (default).</p>

Table B-6 *continued***Custom Statistics for NE2000, NE2, NE2_32, NE1000, and Other Ethernet Drivers**

Statistic	Description
RICAddressWasInvalidCount	(NE32HUB) This counter is incremented when the RIC address was corrupted on a receive management packet. The driver expects this number to be correct.
TxTimeOutCount	(NE32HUB) This counter is incremented when a transmit doesn't occur in 2 seconds.
Port0ErrorCount	(NE32HUB) This counter is incremented when the port address is set to zero. The port address should always be between 1 and 12. This will not occur frequently.
PortBigErrorCount	(NE32HUB) This counter is incremented when the port address is above 13. The port address should always be between 1 and 12. This will not occur frequently.
ValidCRCCount	(NE32HUB) This counter is incremented when the Management Information overlaying the CRC is correct. The Management Information should be incorrect. This event should rarely occur.

Table B-7
Custom Statistics for Token Ring Drivers

Statistic	Description
Bad Correlator Count	<p>(TOKEN, NTR2000) This counter is incremented when a network board responds with a request for data from the file server that the file server does not have.</p> <p>The ECB or some other code may be corrupted. Eventually, this error will abend the server.</p> <p>If this counter is non-zero, you should try to find the software that is corrupting the data.</p>
Unknown ARB requests	<p>(TOKEN, NTR2000) This counts bad Adapter Request Blocks (ARBs).</p> <p>Normally the network board (adapter) uses one of four known commands to communicate with the driver.</p> <p>If a network board sends a command that is not one of the four, the driver does not recognize the request.</p> <p>This error is not a catastrophic error.</p> <p>Sometimes old adapters send bad ARB requests because of software problems on the board.</p> <p>NetWare responds to the network board so that the board will not hang.</p>
MicroChannel Error Count	<p>(TOKENDMA) This counter tracks the number of times the adapter had a problem transmitting on the bus.</p> <p>The adapter interrupt occurred from the firmware on the card.</p>
ECBs Over 16Meg	<p>(TOKENDMA) This counter tracks the number of packets received that had to use an ECB over 16 MB.</p> <p>This number should only increment when more than 16 MB of RAM is used in the server.</p>
DMA Bus Errors Count	<p>(TOKENDMA) This counter is incremented when a DMA transfer completes with a bus error.</p> <p>If this counter is incremented, it could indicate a hardware problem.</p>

Table B-7 *continued*

Custom Statistics for Token Ring Drivers

Statistic	Description
DMA Parity Errors Count	(TOKENDMA) This counter is incremented when a DMA transfer completes with a parity error. If this is incremented, it could indicate a hardware problem.
Command Reject Count	(TOKENDMA) This counter is incremented when the driver sends a command to the board and the command is either invalid or the board is still busy processing the previous command. This number should be zero or a low number.
Tx Timeout Count	(TOKENDMA) This counter is incremented and the adapter is reset if 2 seconds elapse before the driver learns from the firmware that the transmit was or wasn't successful. This counter shows the driver is successfully recovering from the lost hardware transmit. It isn't a problem if this number is incremented.
Transmit Late Count	(TOKENDMA) This counter is incremented when the firmware reports that the card transmitted more than it actually did. After this event occurs, the data that wasn't transmitted will be sent in the next packet. This problem is more likely to occur on busier networks.

Table B-7 *continued***Custom Statistics for Token Ring Drivers**

Statistic	Description
Transmit Defragment Count	<p>(TOKENDMA) This counter tracks how many ECBs are redirected to the buffer below 16 MB.</p> <p>The IBM Token-Ring DMA LAN boards are not able to access memory above 16 MB. Therefore, if the operating system issues an Event Control Block (ECB) with a memory address above 16 MB, the board uses some of the reserved buffers below 16 MB to double buffer the ECB.</p> <p>These are not errors. In many cases, this counter can be as high as the total packets sent and received. However, this double buffering decreases performance.</p> <p>If the system has more than 16 MB of RAM and a board that is bus-mastering or using DMA that is not a 32-bit adapter, performance may decrease.</p>

Table B-8**Custom Statistics for IBM Baseband PCN2L Drivers**

Statistic	Description
HotCarrierInterruptCount	<p>(PCN2L) This counter is incremented when the board detects a carrier longer than expected without a transmit.</p> <p>This indicates that some board on the network has failed or is beginning to fail.</p>
No82588InterruptCount	<p>(PCN2L) This counter is incremented each time the server receives an interrupt from the board, but not from the 82588 chip.</p> <p>This should very seldom, if ever, happen.</p>
WeirdInterruptCount	<p>(PCN2L) This counter is incremented when the server has received an interrupt from the board, but the board claims not to have sent one.</p> <p>This should very seldom, if ever, happen.</p>
BadTransmitComplete-InterruptCount	(PCN2L) This counter is incremented for each complete transmission with no transmit active.

Table B-8 *continued*

Custom Statistics for IBM Baseband PCN2L Drivers

Statistic	Description
HardTransmitErrorCount	(PCN2L) This counter is incremented when a transmit fails and the driver retries the transmit.
GotNothingCount	(PCN2L) This counter is incremented when the driver receives an interrupt from the board indicating that it has completed a receive but there is no data in the board's receive buffer. This is not serious.
ReceiveUnderrunErrorCount	(PCN2L) This counter is incremented when the driver finds less data in the board's buffer than the board reported.
ReceivedShortPacketCount	(PCN2L) This counter is incremented when a packet of less than 17 bytes is received.
BadReceiveConditionCodeCount	(PCN2L) This counter is incremented when the buffer is flushed because the board hasn't received the incoming packets properly.



appendix

C

Memory Domains for NLMs and Autoloaded NLMs

Memory Domains for NLMs

A NetWare® Loadable Module™ program (NLM) can run in either the OS domain or the OS_PROTECTED domain. (To determine the recommended memory domain for a third-party NLM, check the documentation that came with the NLM.)

Most NetWare NLM programs can be loaded in either the OS_PROTECTED or the OS domain. However, some can be loaded only in the OS domain.

NLMs That Must Be Loaded in the OS Domain

CDROM
DISKSET
INSTALL
IPXS
MONITOR
NMAGENT
PSERVER
REMOTE
RPL
RS232
RSPX
RTDM
SPXCONFIG
SPXS
TLI
UPS
VREPAIR

Modules with Shared Libraries

The following modules with shared libraries can be accessed by modules from any domain:

CLIB
MATHLIB
MATHLIBC
NUT
NWSNUT
STREAMS

Autoloading Modules

Important  These modules normally don't need to be loaded or unloaded. Some modules, such as DS.NLM, cannot be unloaded.

Module	Description
AFTER311	In NetWare 4, this NLM is a stub required by some NLMs. In NetWare 3, this NLM provides functionality to allow some NetWare 4 NLM files to work on a NetWare 3 server. In most cases, you don't need AFTER311.
AIO	Used with RS232. Will load with AIOCOMX (COM port driver).
APPLETLK	Supports the AppleTalk protocol suite. Used by any NLM that requires communication through the AppleTalk protocol suite. Autoloaded by ATFLT, AURP, ADSP, and MACIPXGW.
CLIB	Provides library calls to modules that require them. If CLIB is not loaded and is required by an NLM, that NLM usually autoloads CLIB.

Module	Description
CONLOG	Autoloaded if you use INETCFG to configure protocols. Keeps a log of console activity from the time the server is booted. Note: View the log from INETCFG.
CSLSTUB	A stub NLM that provides the routines for modules that use CSL (Call Support Layer). CSL provides WAN access. An NLM using CSLSTUB will only allow LAN connectivity. Autoloaded by FILTCONV, APPLETLK, IPXRTR, IPXCON, FILTSVER, and INETCFG.
DS	Critical for running any NetWare Directory Services™ (NDS) applications. <i>The OS will not allow you to unload this NLM.</i>
DSI	Installs NDS during server installation. Loaded and unloaded as needed by INSTALL.
DSLOADER	DSLOADER autoloads DS.NLM. DSLOADER is not a separate NLM, but is bound into the server. <i>The OS will not allow you to unload this NLM.</i>
FILTSVR	Supports protocol filtering. It communicates filtering configuration from the FILTCFG utility to the Appletalk, TCP/IP, and IPX protocol modules. Autoloaded by FILTCFG, ATFLT, IPFLT, and IPXFLT.
ICMD	Allows script extensions for the installation loadable module. This utility is autoloaded when needed. <i>Don't load this NLM directly.</i>
IPXRTR	Supports IPX and NLSP protocols. This NLM is used by any other NLM that requires communication using IPX/NLSP. (NLSP is the NetWare Link Service Protocol link state routing protocol used by IPX.) Autoloaded by IPXCON and IPXFLT.

Module	Description
IPXRTRNM	Manages the IPX/NLSP protocols. It is used by any NLM that requires Simple Network Management Protocol (SNMP) management information from IPXRTR.NLM.
IPXS	STREAMS-based IPX protocol. Autoloaded by NLM files that require the STREAMS-based IPX protocol.
MSM	Media Support Module. This NLM is autoloaded by some LAN device drivers. It maintains certain LAN driver statistics.
NUT	Used with NetWare 3.11 loadable modules that require NUT's library of routines and functions.
NWSNUT	Used with NetWare 4 loadable modules that require NWSNUT's library of routines and functions.
NWTIL	Required by DOMAIN.NLM. NWTIL is autoloaded when you load DOMAIN.NLM. This NLM is required each time you load NLM files into the OS PROTECTED domain. Once you have loaded these modules, you can unload this NLM to reclaim memory.
NWTILR	Required by DOMAIN.NLM This NLM is autoloaded when you load DOMAIN.NLM.
RTDM	(Real Time Data Migration) Required by HCSS.NLM to enable migration. It is autoloaded by HCSS.NLM
SMDR	SMS Data Requestor. This is automatically loaded by SBACKUP and other modules, and is unloaded manually only if unloading SBACKUP.
SMSDI	SMS Storage Device Interface. This is automatically loaded by SBACKUP, and is unloaded manually only if unloading SBACKUP.

Module	Description
STREAMS	Provides a common interface between NetWare and transport protocols such as IPX/SPX, TCP/IP, AppleTalk, and OSI. This NLM is autoloaded by CLIB and other modules that provide access to protocols.
TLI	An application programming interface that sits between STREAMS and applications, allowing interface with transport level protocols such as IPX/SPX or TCP/IP.
TSM	Topology Support Module. This NLM is autoloaded by some LAN device drivers. This NLM maintains certain LAN driver statistics.
	The NLM that is autoloaded depends on your server's LAN driver. Some of the modules are: ETHERTSM (Ethernet), TOKENTSM (token ring), RXNETTSM (Arcnet) and PCN2LTS (PCN2L).
TIMESYNC	A module bound into SERVER.EXE that coordinates network time synchronization between NetWare servers. Critical for NetWare Directory Services. <i>Don't unload this NLM.</i>
TUI	Textual User Interface. Used by NWSNUT utilities to provide a common look across NLM programs. Autoloaded by INETCFG, INETLIB, SPXCONFIG, FILTCFG, TCPCON, ATCON, IPXCON, FILTCFG.
UNICODE	A module bound into SERVER.EXE that translates code from the server language to Unicode. (For more information, see "Unicode" in <i>Concepts</i> .) NetWare Directory Services depends on UNICODE. <i>Don't unload this NLM.</i>



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