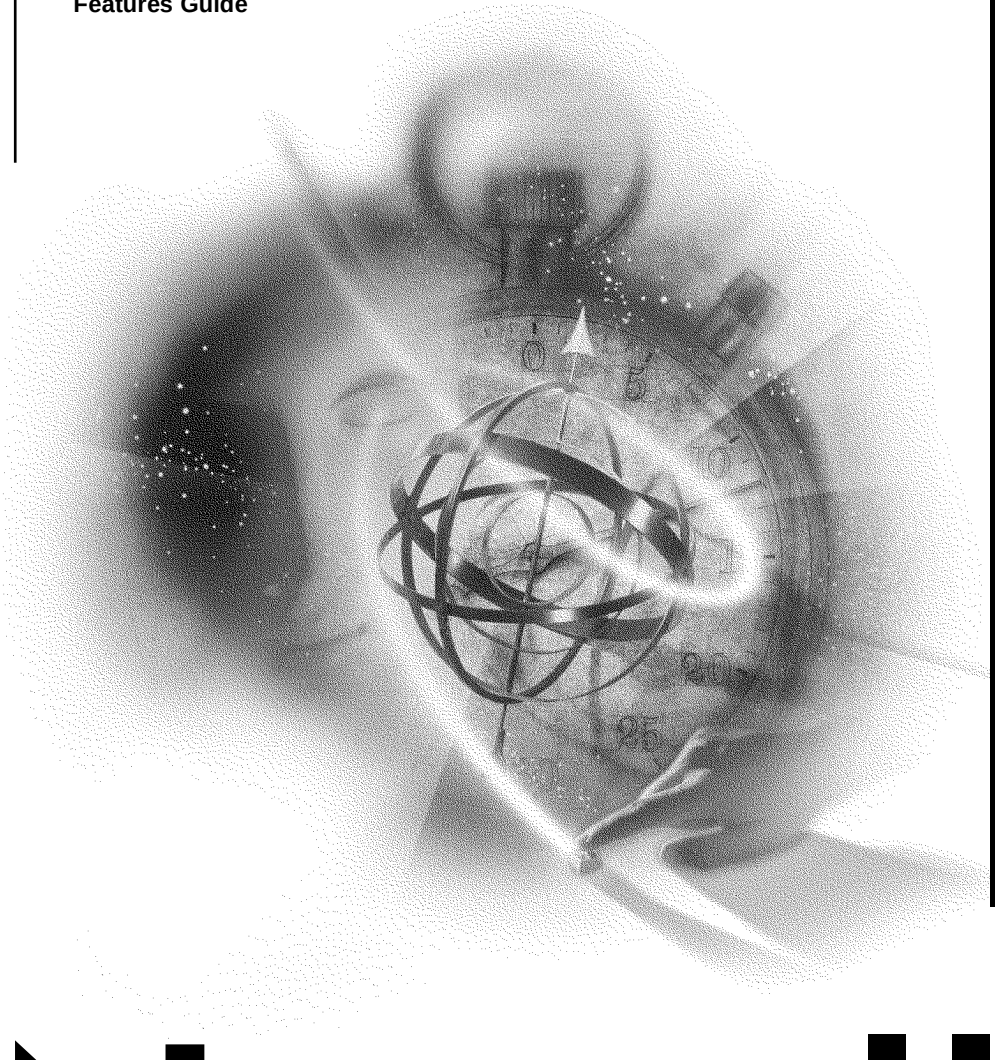
VERSION 4.2

NetWare 4

Features Guide



NetWare® 4
NETWORK SOFTWARE

Novell®

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Contents

About NetWare 4

1 Differences between NetWare 3 and NetWare 4

2 Features in NetWare 4.11/4.2

3 New and Enhanced NetWare Utilities

Trademarks

About NetWare 4

This manual introduces you to new and updated features included in the latest version of the Novell® NetWare® 4™ operating system, NetWare 4.2.

NetWare 4.2 is the ideal operating system for organizations of all sizes that require a high-performance, reliable, cost-effective network services platform.

NetWare 4.2 provides

- Enhanced basic network services, such as file and print services.
- Industry-leading security, directory, routing, and management services.

Unlike competitive network operating systems, NetWare 4 is based on many years of experience and provides networking solutions that are available today and ready for tomorrow. Also, Novell's networking solutions are supported by extensive sales and support channels.

How to Use This Manual

How you approach the information in this manual depends on how much you already know about the NetWare operating system and its related services.

The following table indicates which chapter you should begin with, depending on your background.

If you are	Then
New to networking or the NetWare operating system	Scan the material in this book and begin reading *Guide to NetWare 4 Networks*; then read *Installation and Upgrade*.
Upgrading from NetWare 2 or NetWare 3 to NetWare 4	Begin with Chapter 1, “Differences between NetWare 3 and NetWare 4,” on page 1.
Upgrading from NetWare 4.*x* to NetWare 4.2	Begin with Chapter 2, “Features in NetWare 4.11/4.2,” on page 17.

As you read through the information in this manual, you may be unfamiliar with a few terms or acronyms. For additional information on NetWare and networking terms, see NetWare 4 *Concepts*.

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chapter 1

Differences between NetWare 3 and NetWare 4

The following table provides a summary of the major differences between the NetWare® 3 and the NetWare 4 operating systems.

Table 1-1

Differences between NetWare 3 and NetWare 4

Service	Feature or Utility	NetWare 3	NetWare 4
Bindery/Novell Directory Services™ (NDS™)	Database of network resources	Server-based bindery	Global, distributed directory
Server Operating System	Language support	Supports English	Supports multiple languages
Installation	Install from CD-ROM	Not supported in NetWare 2 or NetWare 3.11 NetWare 3.12 requires a system disk in addition to the CD-ROM	Fully supported
	Simple and custom installation options	Not available	Included
File Services	Automatic file compression	Not available	Included
	Block suballocation	Not available	Included
	NetWare Peripheral Architecture™	Not supported until NetWare 3.12	Fully supported
	High Capacity Storage System	Not available	Included
Storage Management Services™	SBACKUP utility	Basic functionality	Improved interface and performance
	SBACKUP utility	Writes backup files in a proprietary format	Writes SIDF-compliant backup files
	Target Service Agents	Limited support	Improved performance; can be managed by NetWare Navigator™ hosts

Service	Feature or Utility	NetWare 3	NetWare 4
Connectivity Services	Protocol Management	Limited support	Enhanced support for multiple protocols and additional utilities
	Large Internet Packets	Not supported	Supported
	Packet Burst™ Protocol	Not supported	Supported
	Load and bind multiple protocols during installation	Not available	Support for AppleTalk* and TCP/IP in addition to IPX™
Print Services	Print Server, Print Queue, and Printer information	Bindery based	Directory based
	Print Server	Service up to 16 printers	Service up to 256 printers
Security Services	RSA public/private key encryption	Not available	Fully implemented
	AUDITCON utility	Not available	Provides auditing of file system and Directory events

The rest of this chapter provides more detailed information about the major differences between the NetWare 3 and NetWare 4 operating systems.

Novell Directory Services

The most significant difference between NetWare 3 and NetWare 4 is the use of Novell Directory Services (NDS™). NDS provides a powerful infrastructure that is used to locate and access information across a network and beyond.

The key element of NDS is the Directory, a distributed database containing records for all the network resources an organization requires. Users, groups, and network resources, such as printers, servers, and volumes, are represented as individual objects in the Directory database.

The Directory database organizes resources in a hierarchical tree structure, independent of their physical location. Users and supervisors can access any network service without having to know the physical location of the server that provides the service.

The Directory replaces the bindery, which served as the system database in NetWare 3. In NetWare 3, each server required its own bindery, which was managed independently of all other servers and their binderies. In NetWare 4, however, NDS supports an entire network of servers. Instead of storing network information on one server that can become a single point of failure, information is distributed and replicated throughout the network.

In NetWare 4, compatibility with previous versions of NetWare is provided through Bindery Services and the NetSync™ utility.

The following table provides references for more information:

For information about	Refer to
Understanding NDS	*Guide to NetWare 4 Networks*
Configuring and managing NDS	"Managing Novell Directory Services Objects" in *Supervising the Network*
Enhancements in NetWare 4.11/4.2	"Novell Directory Services" on page 20 in this book

Server Operating System

The NetWare server operating system has been enhanced and improved in NetWare 4. The most important changes are described here.

Multiple Language Support

The NetWare 4 operating system, NetWare Loadable Module™ (NLM™) programs, and utilities use English as the default language but can be set to several other languages. You can have NLM programs running in different languages at the same time. In addition, you can set the language for the following: Server, Message files, and Console keyboard.

Additional Hardware Bus Support

With NetWare 4, the NetWare server operating system supports the PCI and PCMCIA bus systems.

Additional Information

For information about	Refer to
Configuring NetWare to use other languages	"Common Management Tasks" in *Supervising the Network*
Enhancements in NetWare 4.11/4.2	"Server Operating System" on page 24 in this book

Installation

To improve the process of installing NetWare 4, the installation program and system files are available on CD-ROM, and you can choose to install NetWare using a simple or custom option.

Installing from CD-ROM

All NetWare 4 program files are now contained on the *NetWare 4 Operating System* CD-ROM. Online documentation files are contained on the *NetWare 4 Online Documentation* CD-ROM.

With the *NetWare 4 Operating System* CD-ROM, you can install the NetWare operating system quickly and without swapping disks.

Installation Options

You have two options to control the complexity of installing NetWare 4: the simple installation or the custom installation.

Simple Installation

The simple installation option makes a number of assumptions and therefore requires the installer to make fewer decisions. This makes a NetWare 4 server easy and quick to install.

The simple installation configuration creates a simple, one-level Novell Directory Services (NDS) organization. If you want additional levels, they can be added to the organization later using the NetWare Administrator utility.

Custom Installation

The custom installation option makes no assumptions, enabling you to customize a server installation.

Some NetWare options, such as spanning volumes across multiple drives and loading and binding TCP/IP and AppleTalk protocols, are available only through the custom installation option.

The custom installation option enables you to create a multilevel Directory structure, meaning the Directory tree can have more than one container object.

Novell Product Installations

You can install a variety of other Novell® products at the same time as you install the server.

You can also perform installation tasks such as upgrading print services, and configuring communication protocols.

Version Checking during Installation

During the file copying process, when existing or newer version files are located, a prompt appears indicating the existence of the file on the server.

Options displayed on the screen then enable you to choose the following actions: continue and overwrite the file, do not overwrite the file, always overwrite files, never overwrite files, or abort copying.

Additional Information

For information about	Refer to
Installing NetWare 4	*Installation and Upgrade*
Enhancements in NetWare 4.11/4.2	“Installation” on page 28 in this book

File Services

With NetWare 4, file system improvements include automatic file compression, block suballocation, NetWare Peripheral Architecture support, and extended storage capacity.

File Compression

File compression enables NetWare 4 to compress files as they are saved to a server's hard disk. Using file compression enables a server to more effectively use disk space. For example, 600 MB of data on a volume can be compressed to as little as 222 MB.

Users can flag their files or directories so that they are compressed after being used or so that they are never compressed. If files flagged for compression are not accessed for a set amount of time, they are automatically compressed. Files are uncompressed when a user accesses them again.

File compression does not reduce network traffic because data is compressed only on the hard disk. Files saved to a backup tape cannot

be compressed with this feature, but they can be backed up in the compressed format.

A volume is enabled for file compression by default when you install NetWare 4. However, during an upgrade to NetWare 4, a volume is disabled for file compression by default.

Block Suballocation

Block suballocation allows a portion of a file that exceeds the volume's default block size to share a disk block with other files. This enables a more efficient use of server disk space.

NetWare Peripheral Architecture

The NetWare Peripheral Architecture (NWPA) enables broader driver support for host adapters and connected hardware devices.

NWPA separates NetWare driver support into two components: a Host Adapter Module (HAM) and a Custom Device Module (CDM). The HAM drives the host adapter hardware (bus). The CDM drives hardware devices attached to a host adapter bus.

The main advantages of using NWPA rather than a single disk driver (a .DSK file) are that NWPA is better designed for scalability and that CDMs enable autodetection of hardware. When you want to connect a new hardware device to the host bus adapter, you need to load only the appropriate HAM. NWPA.NLM is automatically loaded and the computer is scanned for new devices. If a new device is found, the appropriate CDM is loaded.

High Capacity Storage System (HCSS)

HCSS extends the storage capacity of a NetWare server by integrating an optical disk library, called a *jukebox* , into the NetWare file system. A jukebox is a high-capacity storage device that uses an autochanger to mount and dismount optical disks that are held in an optical drive.

HCSS uses a process called *data migration* to move file data between faster, low-capacity storage devices (the server's hard disk) and slower, high-capacity storage devices (optical disks in a jukebox). HCSS uses free space on the server's hard disk to temporarily cache the most active

files. When the volume reaches its preconfigured limit and space is needed to store additional files, the least-active files are transparently migrated to optical disks, and more volume space becomes available.

When a user requests a migrated file, HCSS automatically copies the file from the jukebox to the server's hard disk. Users and programs access files on a jukebox using the same commands used to access files from the hard disk. To the network user, the pathname of a file remains the same whether the file resides on the hard disk or on an optical disk.

HCSS places a *migration key* for all migrated file data on any volume with migrated data. If the server goes down, only the migration key needs to be restored. The migrated file data remains intact on the jukebox.

Additional Information

For information about	Refer to
File compression	"Using File Compression" in *Supervising the Network*
Block suballocation	"Manage NetWare Volumes" in *Installation and Upgrade*
NetWare Peripheral Architecture	"NetWare Peripheral Architecture (NWPA)" in *Installation and Upgrade*
HCSS	"Migrating Data Using the High Capacity Storage System" in *Supervising the Network*
Enhancements in NetWare 4.11/4.2	"File Services" on page 29 in this book

Storage Management Services

NetWare 4 includes an enhanced version of the Storage Management Services (SMS™) software.

SMS enables data to be stored and retrieved from storage devices attached to the network. SMS functions independently of specific backup and restore hardware and file systems such as DOS, OS/2, Macintosh, Windows, or UNIX.

SMS can use media that is compliant with the System Independent Data Format (SIDF) specification, the industry standard for hardware and software independent backup and restore processes.

Improvements in SBACKUP.NLM

The SBACKUP.NLM utility, which is Novell's SMS-compliant backup utility, has been simplified to make custom backup and restore operations easier. In addition, SBACKUP's performance has been improved.

SBACKUP writes media that is compliant with the System Independent Data Format (SIDF) specification, and backup tapes made with SBACKUP can be read by any restore application that reads and writes SIDF-compliant media.

Enhanced Target Service Agents

A Target Service Agent (TSA) is a software program that runs on a server or workstation that, in conjunction with an SMS-compliant backup utility, allows data from a specific workstation or server to be backed up and restored.

Novell's workstation TSA program has been improved to process requests up to 30% faster and now supports management from NetWare Navigator hosts.

Note: NetWare Navigator is an electronic data and software distribution tool, which is sold separately. NetWare Navigator enables network supervisors to distribute and install business-critical applications, desktop operating systems, and network operating systems to workstations and clients.

Novell's NDS TSA program has been improved to enable you to restore specified Directory contexts without having to restore the entire backup session of the Directory database.

Additional Information

For information about	Refer to
Storage Management Services and the SBACKUP utility	"Backing Up and Restoring Data" in *Supervising the Network*
Target Service Agents	"Target Service Agent" in *Concepts*
NetWare Navigator	Your local Novell Authorized Reseller or call 1-800-NETWARE (638-9273)
Enhancements in NetWare 4.11/4.2	"Storage Management Services (SMS)" on page 30 in this book

Connectivity Services

Notable features affecting NetWare connectivity in NetWare 4 include improved utilities for managing multiple protocols, support for Large Internet Packets, the Packet Burst protocol, the NetWare Link Services Protocol™, and the ability to load and bind multiple protocols during a NetWare server installation.

Protocol Management

NetWare 4 provides extensive internetworking services. Supported protocols enable systems on separate LAN segments to communicate, even if the LAN types are different. NetWare 4 supports the most popular network protocols (IPX, AppleTalk, and TCP/IP) and the most popular data-link protocols (Ethernet, token ring, ARCnet*, LocalTalk*, and FDDI).

NetWare 4 protocols are based on accepted networking standards wherever these are available to ensure compatibility with workstations, servers, and routers from other vendors. LAN interfaces use the Novell Open Data-Link Interface™ (ODI™) specification, so you can choose LAN controller boards from many vendors and many media types.

NetWare 4 includes the new INETCFG utility, which guides you through the internetwork configuration process with menus, windows, and context-sensitive help. For example, INETCFG provides facilities for configuring boards and protocols. This utility replaces an older style of configuration that required you to edit LOAD and BIND commands manually.

The MONITOR utility lets you view IPX and LAN interface statistics, as well as numerous system resources, such as memory pools, CPU usage, and NetWare Loadable Module (NLM) programs.

Management of the IPX, TCP/IP, and AppleTalk protocols is implemented through the Simple Network Management Protocol (SNMP) according to the most recent standard Management Information Base (MIB) definitions for each protocol. The IPXCON, TCPCON, and ATCON utilities use SNMP to examine protocol statistics and tables and to modify some parameters. You can manage the instrumented protocols with the Novell ManageWise™ product or any other SNMP-based console.

Large Internet Packets

Prior to NetWare 4, a workstation negotiated with a NetWare server to determine an acceptable packet size for all communications. If, during this negotiation, the server detected a router between it and the workstation, the server limited the maximum packet size to 576 bytes.

However, some network architectures, such as Ethernet and token ring, support packets larger than 576 bytes. So, the Large Internet Packet (LIP) feature enables a workstation to determine the maximum packet size based on the maximum size supported by the router.

With NetWare 4, the LIP feature is enabled by default at both the server and workstation.

Packet Burst Protocol

The Packet Burst protocol enables high-performance NCP data transmission between workstations and servers by eliminating the need to sequence and acknowledge each packet. Packet Burst is designed to transmit multipacket messages efficiently over the internetwork.

NetWare Link Services Protocol

To improve internetwork communications, Novell introduced the NetWare Link Services Protocol (NLSP). Where NetWare servers have traditionally used RIP (Routing Information Protocol) to exchange routing information and SAP (Services Advertising Protocol) to exchange service information, NLSP provides link state routing for IPX internetworks.

NLSP exchanges routing information between routers and makes routing decisions based on that information. For workstation-to-router communication, NLSP routers continue to use RIP and SAP.

NLSP routers exchange information such as connectivity states, path costs, throughput, maximum packet size (MTU size), and networks learned through RIP (external network numbers). In networks with RIP/SAP devices, NLSP routers keep track of services and external (RIP-based) routes. By exchanging this information with its peer routers, each NLSP router builds and maintains a logical map of the entire network.Unlike RIP and SAP, which periodically broadcast routing and service information, NLSP transmits routing information only when a change occurs in a route or service, or every two hours—whichever occurs first.

Load and Bind Multiple Protocols

If you choose the custom installation option to install a NetWare 4 server, you can specify whether you want the NetWare 4 server to load the TCP/IP and AppleTalk protocols in addition to the Internetwork Packet Exchange (IPX) protocol.

If you select TCP/IP, you are prompted to enter a valid IP address and IP mask number. You are also prompted to install the NetWare/IP software.

Additional Information

For information about	Refer to
The Large Internet Packet feature	“Large Internet Packet” in *Concepts*
The Packet Burst protocol	“Packet Burst protocol” in *Concepts*
NLSP	*Novell Guide to NLSP Migration*
Loading and binding protocols during installation	“Load the Device Drivers” in *Installation and Upgrade*
The NetWare/IP software	*NetWare/IP Administrator's Guide*
Enhancements in NetWare 4.11/4.2	“Connectivity Services” on page 32 in this book

Print Services

With NetWare 4, traditional NetWare print services have been improved.

Printing and the Directory

In NetWare 3, only the print server and print queues exist as bindery objects; printers are defined as attributes of the print server.

In NetWare 4, print servers, print queues, and printers are all represented as individual objects in the Directory. Each Print Server, Print Queue, and Printer object can be created and managed independently.

Additionally in NetWare 4, network users do not need to know about print queues or print servers. Users can send print jobs to a printer by simply specifying the printer name. NetWare and the Directory take care of all print queue activity.

Other Enhancements

With NetWare 4, print services have been enhanced to include the following features and improvements:

- NetWare 4 servers use NPRINTER.NLM to make attached printers available to the network; DOS workstations use NPRINTER.EXE, which replaces RPRINTER.EXE at the workstation.
- A single print server can now service up to 256 printers.
- NetWare 4 print servers include complete compatibility with the SFT III™ environment.
- You can now configure print queue polling intervals.
- NetWare 4 includes support for third-party print job configurations, and you can now have an unlimited number of print job configurations.
- PCONSOLE includes a Quick Setup feature.
- You can manage network printing with the NetWare Administrator utility.

Additional Information

For information about	Refer to
Network printing and the Directory	"Planning and Setting Up NetWare Print Services" in *Print Services*
NPRINTER.NLM and NPRINTER.EXE	"Setting Up and Servicing Print Servers" in *Print Services*
Manaing Print Services with the NetWare Administrator utility	"Managing Print Services with the NetWare Administrator Utility" in *Print Services*
Enhancements in NetWare 4.11/4.2	"Print Services" on page 33 in this book

Auditing

The AUDITCON utility provides auditing functionality in NetWare 4. Auditing is the process of monitoring your records and systems to ensure information is properly protected, handled, and managed. AUDITCON, which is fully configurable and protected by password, records specific Directory and file system events on the network.

The following table references where to find more information:

For information about	Refer to
AUDITCON	*Auditing the Network*

chapter 2

Features in NetWare 4.11/4.2

The following table provides a summary of the major differences between previous versions of NetWare® 4 and the NetWare 4.11/4.2 operating system.

Table 2-1

New Features in NetWare 4.11/4.12

Service	Feature or Utility	Previous versions of NetWare 4	NetWare 4.11
Novell® Directory Services™	NetWare Administrator	Windows 3.*x* version only	Windows 3.*x* and Windows 95/98 versions
		Limited customization capabilities	Configurable status bar, toolbar, property pages
		Supports connection to a single Directory tree	Supports connection to multiple Directory trees
	Partition and replica management	Managed by PARTMGR and Partition Manager	Managed by the new NDS™ Manager utility
Application Services	NetWare Application Manager™ and NetWare Application Launcher™	Unavailable	Included, providing managed access to network applications
NetWare Licensing Services	Integrated license management	Unavailable	Included
Server Operating System	Abend recovery	Limited options	Improved abend recovery options
	NetWare Symmetric MultiProcessing	Available from OEM partners only	Included
	UPS connections	Limited to mouse port or third-party card	Serial port connection supported
	CLIB.NLM	A single module	6 related modules
Installation	Hardware detection	Limited	Substantially improved
	Upgrade utilities	Limited	Existing utilities have been improved and two additional migration utilities are provided

Service	Feature or Utility	Previous versions of NetWare 4	NetWare 4.11
File Services	Support for long filenames	Not supported	LONG.NAM supports extended name spaces for the Windows 95/98 amd Windows NT
	Volume capacity	Limit of 2 million directory entries	Each NetWare volume can handle up to 16 million directory entries
Storage Management Services™	SBACKUP	Limited backup services for NDS	Improved backup services for NDS
	Target Service Agents (TSA)	Available for DOS and Windows 3.1*x*	Windows 95/98 TSAs included
Connectivity Services	NetWare/IP 2.2	Available, but not integrated	Fully integrated
Print Services	NPrinter Manager (NPTWIN95.EXE)	Unavailable	Enables you to make a printer connected to a workstation using Windows 95/98 available to network users.
	NetWare Administrator	No Quick Setup for Print Services	Print Services Quick Setup option available
	AUDITCON	Limited events auditing	Can audit many additional events
Net2000	APIs designed to expose network services for developing distributed network applications	Unavailable	Included

The rest of this chapter provides more detailed information about the major differences between previous versions of NetWare 4 and the NetWare 4.11 / 4.2 operating system.

Novell Directory Services

With each release of NetWare 4, Novell Directory Services has been improved. In NetWare 4.11/4.2, the Directory has been enhanced or changed in the following ways:

- The User Template object is now an object class, or a specific type of object, instead of a User object with a specific name and attributes. The User Template object enables you to create users quickly.

  When defining the User Template, you can specify a set of default values for User objects, including rights to the file system and Directory objects. Also, you can define a setup script for copying files into the new user's home directory.

  The User Template object facilitates setting up new User objects. However, you cannot use the User Template object to modify existing User objects.

- Audit Log files are now represented by and managed as Directory objects. This enables you to control access to Audit Log files by using Directory rights assignments.

In addition to these improvements, the utilities you use to manage Novell Directory Services have been updated and enhanced. The most important enhancements are described here.

NetWare Administrator and NETADMIN

The primary utilities you use to manage the Directory, the easy-to-use, graphical NetWare Administrator utility or the DOS menu-based NETADMIN utility, have been enhanced to include the following features:

- A Windows 95/98 version of NetWare Administrator is included in NetWare 4.2.

  There is no difference between the functionality available in the Windows 3.*x* and the Windows 95/98 versions of NetWare Administrator. The executable path and filename for the Windows 95/98 version of NetWare Administrator is

  SYS:PUBLIC\WIN95\NWADMN95.EXE

- The interface in NetWare Administrator has been improved with a configurable toolbar, which provides shortcuts to menu options, a configurable status bar, and the ability to hide and sort property pages for individual Directory objects.

- With NetWare Administrator, you can now print the Directory tree structure.

- You can now manage multiple trees simultaneously from within NetWare Administrator. You can open browse windows for multiple trees at once and drag and drop Directory objects between windows.

- You can set property values for multiple objects at the same time with the Details on Multiple Users option in NetWare Administrator. You can change values for multiple users, containers, templates, or groups.

- You can use the Rename Subtree option in NetWare Administrator or NETADMIN to rename a container object.

- You can use the Move Subtree option in NetWare Administrator or NETADMIN to move a container object that is the root of a Directory partition to a different context in the Directory tree.

NDS Manager

With NetWare 4.11 / 4.2, the NDS Manager utility replaces the Partition Manager utility that was available from the NetWare Administrator Tools menu in earlier versions of NetWare 4.

NDS Manager has a graphical, hierarchical browser and many new, powerful features that were not available in Partition Manager. NDS Manager includes the following features:

- Runs as a standalone application or as an integrated part of the NetWare Administrator utility

- Provides partitioning and replication services for the Directory database

- Includes the ability to repair the Directory database from a client workstation

- Includes a version update capability so that any or all NetWare servers in a network can be updated to a newer version of the DS.NLM file
- Context-sensitive help for synchronization errors detected by the Partition Continuity option

Additional Information

For information about	Refer to
Using NetWare Administrator and NETADMIN to manage the Directory	"Managing Novell Directory Services Objects"in *Supervising the Network*
Using NDS Manager to manage partitions and replicas	"Managing the Novell Directory Tree" in *Supervising the Network*

Application Services

With NetWare 4.11 / 4.2, Novell is introducing the NetWare Application Manager (NAM) and NetWare Application Launcher (NAL) utilities.

The NAM utility enables you to represent applications as objects in the Novell Directory. As Directory objects, you can manage Application objects the same way you manage other objects, using the NetWare Administrator utility.

Using Application objects, you can

- Define an application's directory, icon, command line parameters, and other attributes in one place.
- Use trustee assignments to manage access to an application.
- Define startup scripts that establish the appropriate network environment for the application (drive mappings, print captures, etc.) and cleanup scripts that restore the workstation's environment.

The NAL utility, available in a 16-bit version (NALW31.EXE) and a 32-bit version (NALW95.EXE), enables network users to launch applications represented by Application objects.

When started, NAL displays a desktop that contains Application object icons. When the network user clicks on an icon, NAL sets up the workstation and starts the associated application as defined in the Application object's properties. As a network administrator, you can control what applications the network user has access to and the user's ability to adjust the NAL desktop.

The following table provides references for more information:

For information about	Refer to
NetWare Application Manager	"NetWare Application Manager" in *Utilities Reference*
NetWare Application Launcher	"NetWare Application Launcher" in *Utilities Reference*

Messaging Services

In previous versions of NetWare 4, messaging services were provided by NetWare Message Handling Service™ and the FirstMail™ electronic mail utility.

With NetWare 4.11/4.2, NetWare MHS™ services are available on NetWire. Novell now provides the GroupWise™ product line to support messaging services. Contact your Novell Authorized Reseller℠ for more information.

NetWare Licensing Services

With NetWare 4.11/4.2, Novell is introducing NetWare Licensing Services.

NetWare Licensing Services (NLS) is a distributed, enterprise network service that enables administrators to monitor and control the use of licensed applications on a network.

NLS is tightly integrated with the Novell Directory Services (NDS) technology and is based on an enterprise service architecture. This architecture consists of client components that support different platforms and system components that reside on NetWare 4.11/4.2 servers.

NLS also provides a basic license metering tool and libraries that export licensing service functionality to developers of other licensing systems.

The following table provides references for more information:

For information about	Refer to
NetWare Licensing Services	"Managing NetWare Licensing Services" in *Supervising the Network*

Server Operating System

With NetWare 4.11/4.2, the NetWare operating system has been enhanced and improved in several ways. The most important changes are described here.

Improved Abend Recovery Options

With NetWare 4.11/4.2, the server operating system has improved recovery options for handling an abnormal end (abend). These improvements include the following features and capabilities:

- Additional information about the source of the abend is displayed on the server console. This information identifies the NLM or hardware problem that caused the abend so an administrator can take corrective actions.

- When an abend occurs, information about the abend is automatically written to a text file, ABEND.LOG. This file is initially written to the DOS partition. Then, when the SYS: volume is remounted, the information is appended to the ABEND.LOG file in the SYS:SYSTEM directory and removed from the DOS partition.

- When you enter the Secure Console command, DOS is not removed from memory automatically. To remove DOS from memory, you have to explicitly use the Remove DOS command. This enables abend logging and the Auto Restart After Abend functionality when the console is secured.

- Auto Restart After Abend is a new SET parameter that enables the server to automatically recover from an abend in various ways. This parameter is set to ON by default.

- Auto Restart After Abend Delay Time is a new set parameter that enables you to specify how long after an abend the server waits before going down to reinitialize itself.

NetWare Symmetric MultiProcessing

The NetWare Symmetric MultiProcessing (SMP) technology enables the NetWare 4.11 / 4.2 operating system to run on a multiprocessor server. NetWare SMP enables a server to run resource-intensive services, such as large databases, document management software, and multimedia applications on a NetWare server.

SFT III Enhancements

With NetWare 4.11 / 4.2, the NetWare SFT III™ system has been enhanced with two new set parameters and improvements in the PROTOCOLS command.

- The SFT III Error Wait Time set parameter enables you to adjust all SFT III wait times at once. SFT III wait times include: MSL Error Wait Time, Secondary Take Over Wait Time, IPX Internet Down Wait Time, MSL Deadlock Wait Time, and Check LAN Extra Wait Time.

The default values for each of these parameters is usually sufficient. The SFT III Error Wait Time set parameter should be used only for troubleshooting the system.

- The Turbo Memory Synch set parameter enables you to speed up memory synchronization between a pair of SFT III servers.

- In previous versions of NetWare, the PROTOCOLS command did not work with the MSEngine in the SFT III system. With NetWare 4.11 / 4.2, the PROTOCOLS command works identically with the MSEngine, the IOEngine, and non-SFT III servers.

UPS Connection through a Serial Port

With NetWare 4.11 / 4.2, the NetWare operating system now supports an uninterruptible power supply (UPS) connection through a serial port.

This functionality is provided by the UPS_AIO.NLM NetWare Loadable Module program in conjunction with an AIO device driver. In addition, to use UPS_AIO, the serial cable between the the server and the UPS device must be designed for use with the UPS device.

Note: UPS.NLM, which is still provided with NetWare 4.11/4.2, enables a UPS connection through a server's mouse port or third-party card and does not require an AIO device driver.

CLIB Enhanced

With NetWare 4.11 / 4.2, the CLIB.NLM file has been modularized into several NetWare Loadable Module (NLM) programs. The functionality of the previous CLIB.NLM is now available in the following NLM programs:

- **CLIB.NLM** An ANSI-compliant runtime interface for the old CLIB functions

  In addition, the functions of MATHLIB.NLM and MATHLIBC.NLM have been included in the CLIB.NLM. Accordingly, MATHLIB.NLM and MATHLIBC.NLM are not included in NetWare 4.11 / 4.2.

- **FPSM.NLM** Floating point support library

- **THREADS.NLM** NetWare standard NLM threads package
- **REQUESTR.NLM** The standard requester package
- **NLMLIB.NLM** POSIX and other basic NLM runtime support
- **NIT.NLM** The old NetWare interface tools, which are being replaced by interfaces in CALNLM32.NLM

The new set of modules is more efficient and uses 80% less dynamic memory than the old CLIB module.

Platform-Related Improvements

With NetWare 4.11 / 4.2, the server operating system includes the following hardware platform-related enhancements:

- The server memory management routines have been enhanced to take advantage of the Global Page attribute in the Intel* Pentium* Pro microprocessor.
- The high resolution timer routines have been enhanced to take advantage of the internal clock in Intel's Pentium and Pentium Pro microprocessors. This improves the reliability and performance of NetWare 4's Packet Burst™ feature.
- The NetWare operating system more fully supports the Peripheral Component Interface (PCI) bus architecture.

Other Changes

With previous versions of NetWare, you could run untested or suspect NLM programs in a separate memory domain called the OS_PROTECTED domain. This functionality was provided by the DOMAIN utility.

With NetWare 4.11 / 4.2, improvements in the server operating system and enhanced abnormal end (abend) recovery options eliminate the need for the DOMAIN utility.

Additional Information

For information about	Refer to
Improved abend recovery options	“Resolving Abends” in *Supervising the Network*
NetWare SMP	“Enabling SMP Support” in *Supervising the Network*
Enhancements in the SFT III system	“SFT III Management Tips” in *Supervising the Network*
Connecting a UPS device using a serial cable	“UPS_AIO” in *Utilities Reference*
Changes to the CLIB NLM	“CLIB” in *Utilities Reference*

Installation

To ease the installation process, the Install utility autodetects hardware devices installed in the server. In addition, new upgrade utilities are provided with NetWare 4.11 / 4.2.

Hardware Detection during Installation

During a NetWare 4.11 / 4.2 installation, the Install utility automatically detects the hardware devices in a server, including hard disks, CD-ROM drives, LAN cards, etc. It then scans for and selects applicable device drivers (.DSK and .HAM files) for the hardware.

If the server does not have an advanced bus architecture (EISA, PCI, PNPISA, PCMCIA, or MCA) or device type (SCSI and IDE devices), the Install utility might not select the appropriate drivers for the server. In this case, you will need to manually select the appropriate device drivers for hardware in the server.

Additional Information

For information about	Refer to
Detecting network boards in a file server	"Load the Device Drivers" in *Installation and Upgrade*

File Services

With NetWare 4.11 / .4.2, the NetWare file system more effectively supports extended name spaces and can hold 16 million directory entries per volume by default (16 million on DOS-only volumes). In addition, NetWare volumes mount much faster than before, and the file system automatically monitors volume space.

Support for Long Filenames

With NetWare 4.11 / 4.2, LONG.NAM provides the extended name spaces available with the Windows 95 / 98 and Windows NT workstation platforms on a NetWare volume. LONG.NAM is a special type of NetWare Loadable Module that enables non-DOS filenames on a NetWare volume. Because extended name spaces are used more often now, LONG.NAM is loaded as part of the default server configuration.

Volume Capacity Supports 16 Million Directory Entries

With NetWare 4.11 / 4.2, each NetWare server volume can support 16 million directory entries by default and up to 16 million directory entries on volumes that use only the DOS name space. With previous versions of NetWare 4, the limit was 2 million entries per volume. Each additional name space requires and additional entry per file. For example, using only the DOS name space requires one directory entry per file. With the DOS and longname spaces loaded, two directory entries are required.

Other Changes

In addition to the improvements listed above, the NetWare 4.11 / 4.2 file system has changed in the following ways:

- The software responsible for mounting NetWare volumes has been enhanced. Volumes mount much faster now, sometimes more than twice as fast as with earlier versions of NetWare 4.
- The file system monitors NetWare volume space use and proactively purges deleted files to free up volume space when needed.
- The file system responds more efficiently to the new Novell Client architecture, delivering a higher level of performance to workstations using the new Novell Client software.

Additional Information

For information about	Refer to
LONG.NAM	"Name space support" in *Concepts*
NetWare volume capacity	"Maintaining Volumes" in *Supervising the Network*

Storage Management Services (SMS)

With NetWare 4.11 / 4.2, Storage Management Services (SMS) includes an enhanced backup utility, more effective backup and restore capabilities for the Directory, and new Target Service Agents.

SBACKUP Improvements

With NetWare 4.11 / 4.2, SBACKUP has been improved to include the following features:

- You can create session files from tape.
- You can search log files for specific character strings.

- Backup sessions can be verified with CRC values.
- SBACKUP now displays a running count for up to 4.2 Terabytes of data as it is backed up. Previous versions turned over to zero at 4.2 Gigabytes.
- When data is restored, information about the restoration target is written to the error (log) file.

NDS Backup and Restore Improved

With NetWare 4.11/4.2, SBACKUP and the NDS Target Service Agent (TSA) provide more effective backup and restore capabilities than before.

Until now, Directory schema extensions and the mechanisms that enable you to manage file trustee assignments from the Directory were not effectively backed up, and the restoration process involved recreating a server's private key, User object IDs and rights, and replica information on a per volume basis.

With NetWare 4.11/4.2, a server's private key, User object IDs and file trustee assignments, and replica information are effectively maintained throughout the backup and restore process.

Additional Target Service Agents

With NetWare 4.11/4.2, Novell is shipping new Target Service Agents (TSA):

- The new Windows 95/98 TSA is used to back up and restore information on workstations running the Windows 95/98 operating system and the new Novell Client software.
- The NetWare file system TSA has been updated.

Additional Information

For information about	Refer to
Using SBACKUP	"Backing Up and Restoring Data" in *Supervising the Network*
The new TSAs	The documentation provided with each client and "Backing Up and Restoring Data" in *Supervising the Network*

Connectivity Services

With NetWare 4.11/4.2, Novell is incorporating the NetWare/IP™ software into the NetWare product. NetWare/IP is a set of server and client software modules that provide access to a NetWare network using the TCP/IP transport instead of or in addition to the IPX™ protocol used in traditional NetWare networks. NetWare/IP enables you to

- Extend NetWare services and applications to nodes on an existing IP network in a manner that is transparent to users.
- Migrate a network from IPX to TCP/IP.
- Interconnect TCP/IP and IPX networks, enabling users on both networks to access NetWare resources on either network.
- Easily manage TCP/IP addresses using the Dynamic Host Configuration Protocol (DHCP).
- Provide access to network printers attached to UNIX hosts using the lpr protocol.

The current Novell Client that ships with this product supports TCP/IP. See the Novell Client documentation for specific information. For information on using NetWare/IP in an IP-only environment, refer to a special readme file (nwip.txt) found on the Documentation CD-ROM.

The following table provides references for more information.

For information about	Refer to
NetWare/IP	*NetWare/IP Administrator's Guide*

Print Services

With NetWare 4.11 / 4.2, traditional NetWare print services have been improved in the following ways.

- The NetWare Administrator utility now includes a *Print Services Quick Setup* option on the Tools menu. This option provides functionality similar to the *Printing Quick Setup* option in the PCONSOLE utility.

  The *Print Services Quick Setup* option enables you to easily create and associate Print Server, Printer, and Print Queue objects in the Directory.

- You can use the new, graphical NPRINTER Manager (NPTWIN95.EXE) to enable network users to share a printer attached to a Windows 95 / 98 workstation. NPRINTER Manager (and its associated files) provides the same functionality that NPRINTER.EXE provides on a DOS workstation.

Additional Information

For information about	Refer to
The *Print Services Quick Setup* option in NetWare Administrator	"Using Print Services Quick Setup in NetWare Administrator" in *Print Services*
NPrinter Manager (NPTWIN95.EXE)	"Using NPRINTER (Windows 95/98)" in *Print Services*

chapter 3

New and Enhanced NetWare Utilities

This chapter summarizes the major changes and enhancements to the utilities included with NetWare® 4.11 / 4.2.

The first part of this chapter describes utilities that run from the NetWare server console prompt. The second part of this chapter describes utilities that run from a DOS or Windows workstation.

Server Utilities

With NetWare 4.11 / 4.2, there are two types of utilities used at the server console:

- Command line utilities

  Command line utilities are executed by typing the command as described in *Utilities Reference*.

- NetWare Loadable Module™ (NLM™) programs (typically, menu-based utilities)

  NLMs must be loaded from the server console prompt by typing the **LOAD** command followed by the NLM filename.

Figure 3-1 lists all server utilities included with NetWare 4.11 / 4.2. Utilities that are new since NetWare 3.1*x* are listed in bold text. Utilities introduced with NetWare 4.11 / 4.2 are indicated with an asterisk.

The remainder of this section includes a brief summary of each utility that is new or updated since NetWare 3.1*x*.

Figure 3-1

Server Commands and Utilities

Server Utilities

Commands

ABORT REMIRROR
ACTIVATE SERVER (SFT III)
ADD NAME SPACE
ALIAS *
BIND
BROADCAST
CD
CLEAR STATION
CLS
CONFIG
DISABLE LOGIN
DISMOUNT
DISPLAY NETWORKS
DISPLAY SERVERS
DOWN
ENABLE LOGIN
ENABLE TTS
EXIT
HALT (SFT III)
HCSS
HELP
INITIALIZE SYSTEM
LANGUAGE
LIST DEVICES
LOAD
MAGAZINE
MEDIA
MEMORY
MEMORY MAP
MIRROR STATUS
MODULES
MOUNT
MSERVER (SFT III)
NAME
OFF
PMMON (OS/2)
PROTOCOL
REGISTER MEMORY
REINITIALIZE SYSTEM
REMIRROR PARTITION
REMOVE DOS
RESET ROUTER
RESTART (SFT III)
RESTART SERVER
SCAN FOR NEW DEVICES
SEARCH
SECURE CONSOLE
SEND
SERVER
SET
SET TIME
SET TIME ZONE
SPEED
TIME
TRACK OFF
TRACK ON
UNBIND
UNLOAD
UPS STATUS
UPS TIME
VERSION
VOLUME

NLMs and Menu-based Utilities

AFP (Mac OS)
AFPCON (Mac OS)
ATCON (Mac OS)
ATCONFIG (Mac OS)
ATPS (Mac OS)
ATPSCON (Mac OS)
ATXRP (Mac OS)
BRGCON (OS/2)
CDROM
CLIB
CONLOG
DHCPCFG *
DSMERGE
DSREPAIR
EDIT
FILTCFG
FPSM (CLIB)
HFSCD (Mac OS)
HFSCDCON (Mac OS)
INETCFG
INSTALL
IPXCON
IPXPING
IPXS
KEYB
MACFILE (Mac OS) *
MATHLIB (CLIB)
MATHLIBC (CLIB)
MONITOR
MPDRIVER (SMP) *
NETSYNC3
NETSYNC4
NIT (CLIB)
NLMLIB (CLIB)
NPAMS (SFT III)
NPRINTER
NUT
NWIPCFG *
NWSNUT
PING
PSERVER
PUPGRADE
REMAPID
REMOTE
REQUESTR (CLIB)
ROUTE
RPL
RS232
RSPX
RTDM
SBACKUP
SCHDELAY
SERVMAN
SPXCONFG
SPXS
STREAMS
TCPCON
TECHWALK *
THREADS (CLIB)
TIMESYNC
TLI
TPING
UNICON *
UPS
UPS_AIO *
VIEW *
VREPAIR

BOLD = New to NetWare 4
*** =** New to NetWare 4.11

New Server Utilities

Table 3-1 summarizes the server utilities that are new since NetWare 3.1*x*.

Table 3-1
New Server Commands and Utilities

Command or Utility	Description
ABORT REMIRROR	Stops the remirroring of a logical disk partition.
ACTIVATE SERVER	Loads the MSEngine for the NetWare 4.11/4.2 SFT III™ system, synchronizes the memory of both SFT III servers, and executes the MSSTART.NCF and MSAUTO.NCF scripts.
AFP	Provides complete support for the AppleTalk Filing Protocol (AFP) suite.
AFPCON	Enables you to configure the AFP module on a server.
ALIAS	Enables you to abbreviate a long server console command line by assigning it to a short, unique string. When the string is entered at the server console prompt, the full command line appears.
ATCON	Enables you to monitor the activity of AppleTalk network segments.
ATCONFIG	Enables you to configure NetWare for Macintosh after installation.
ATPS	Provides complete support for the AppleTalk Print Services (ATPS) protocols.
ATPSCON	Enables you to configure the ATPS module on a server.
ATXRP	Works with PSERVER to send a print job to an AppleTalk network printer from a NetWare print queue.
BRGCON	Enables you to view bridge configuration information for a NetWare Server for OS/2 bridge.
CD	Enables you to monitor and administer a CD-ROM disk used as a read-only NetWare volume.
CDROM	Enables a server to use a CD-ROM disk as a read-only NetWare volume.
CONLOG	Enables you to capture console messages generated by modules during system initialization and to write the messages to the default file, SYS:\ETC\CONSOLE.LOG, or to another file.

Command or Utility	Description
DOMAIN	Included with NetWare 4.1 to enable a protected memory domain. This utility is not included with NetWare 4.11/4.2 because improved abend recovery options and other server operating system enhancements are more effective.
DHCPCFG	Enables you to manage the NetWare Dynamic Host Configuration Protocol (DHCP) service.
DSMERGE	Enables you to rename and merge Novell® Directory Services™ (NDS™) trees.
DSREPAIR	Enables you to maintain and repair the NDS database on a server.
FILTCFG	Enables you to define filters for the Internetwork Packet Exchange™ (IPX™), TCP/IP, and AppleTalk protocols.
HALT	Use at a NetWare 4.11/4.2 SFT III server console to bring down an IOEngine on one SFT III server while leaving the other IOEngine running.
HCSS	Enables you to view and change a list of High Capacity Storage System (HCSS) commands and current settings.
HELP	Use to view the syntax, a brief description, and an example of a console command.
HFSCD	Provides support for Apple Computer's HFS format for CD-ROM drives.
HFSCDCON	Enables you to configure the HFSCD module on a server.
INETCFG	Enables you to define an internetworking configuration for the IPX, TCP/IP, and AppleTalk protocols, simplifying the process of configuring local area networks using network and routing protocols supported by NetWare 4.11/ 4.2.
INITIALIZE SYSTEM	Enables multiprotocol router configuration by executing all commands in the system NETINFO.CFG file. This utility is typically executed from the AUTOEXEC.NCF file.
IPXCON	Enables you to monitor and troubleshoot IPX routers and network segments.
IPXPING	Enables you to send an IPX ping packet to an IPX server or workstation to determine whether the node is reachable.
KEYB	Sets the keyboard language on a server.
LANGUAGE	Sets the language used by NetWare server utilities.

Command or Utility	Description
LIST DEVICES	Displays current device information for the server.
MACFILE	Provides Mac OS file support on a NetWare server. Also enables maintenance of the Mac OS desktop database.
MAGAZINE [*parameter*]	Confirms whether magazine requests from the server have been satisfied.
MEDIA [*parameter*]	Confirms whether media requests from the server have been satisfied.
MEMORY MAP	Use to display the amount of memory (in bytes) allocated to DOS and to the server.
MIRROR STATUS	Displays all mirrored logical disk partitions and their status.
MPDRIVER	Use to enable processors in a multiprocessor server running NetWare Symmetric MultiProcessing (SMP) software.
MSERVER	Use to load the IOEngine on each NetWare 4.11/4.2 SFT III server.
NETSYNC3	Load on a NetWare 3 server to make it part of a NetSync™ managed network.
NETSYNC4	Load on a NetWare 4 server to manage the NetWare 3 servers in a NetSync environment.
NPAMS	Enables the mounting of a CD-ROM disk as a read-only NetWare volume on a NetWare 4.11/4.2 SFT III server.
NPRINTER	Enables a printer attached to any server to be a network printer.
NUT	Use with NetWare 3.11 NLM programs that require NUT's library.
NWIPCFG	Use to configure and manage the NetWare/IP server software.
NWSNUT	(NLM utility user interface) Provides a library of routines used by certain NLM programs, such as MONITOR or SERVMAN.
PING	Enables you to determine whether an IP node on the network is reachable and provides statistics about the route between nodes. PING sends an Internet Control Message Protocol echo request packet to an IP node and notifies you when it receives a reply.
PMMON	Use to monitor CPU usage on a server running the NetWare Server for OS/2 software.
PUPGRADE	Upgrades NetWare 3.1*x* printing objects, print job configurations, and printer definitions.

Command or Utility	Description
REINITIALIZE SYSTEM	Enables multiprotocol router configuration changes made since the last time the commands in the AUTOEXEC.NCF file were executed. If any new commands are in the NETINFO.CFG file, they are executed.
REMAPID	Load on a NetWare 3.*x* server to handle passwords correctly in a NetSync environment.
REMIRROR PARTITION	Starts the remirroring of a logical disk partition.
RESTART	Reloads the IOEngine on one NetWare 4.11/4.2 SFT III server while leaving the other server running, or forces a server to switch over from primary to secondary.
RESTART SERVER	Restarts the server after you down it.
RPL	(Remote Program Load) Enables remote booting of IBM PC-compatible diskless workstations that have network boards installed.
RTDM	(Real Time Data Migration) Enables data migration at the server console.
SBACKUP	Use to back up and restore specified data on a server, workstation, or service that you select.
SCAN FOR NEW DEVICES	Checks for storage device hardware that has been added since the server was last booted.
SCHDELAY	Enables you to prioritize and schedule server processes to use less of the server's CPU. Also enables you to slow processes when the server is busy.
SERVMAN	Changes SET parameters in the .NCF files. Also displays IPX/SPX™, device, volume, and network information.
TCPCON	Enables you to monitor activity in the TCP/IP segments of the network.
TECHWALK	Use to record NetWare configuration information.
TIMESYNC	Controls time synchronization on servers running NDS.
TPING	(Trivial PING) Enables you to determine whether an IP node on the network is reachable. TPING requires a hostname parameter.
UNICON	Use at the server console to manage certain NetWare/IP products installed on a server, such as the NetWare Domain Name System (DNS) and the NetWare/IP Domain SAP/RIP Service (DSS).

Command or Utility	Description
UPS_AIO	Use to provide the software link between a server and an uninterruptible power supply (UPS) that is connected to a server through the serial port.
VIEW	Use to view (but not edit) a file from the server console.

Consolidated Server Utilities

Table 3-2 summarizes the server utilities that have been consolidated since NetWare 3.1*x*.

Table 3-2
Consolidated Server Utilities

NetWare 3.11 Utilities	NetWare 4 Utilities
BINDFIX, BINDREST	DSREPAIR
FCONSOLE	MONITOR
NBACKUP	SBACKUP
RCONSOLE, ACONSOLE	RCONSOLE

Workstation Utilities

In NetWare 4.11 / 4.2, there are three types of utilities used at a workstation:

- DOS command line utilities

  DOS command line utilities are executed by typing the command at a DOS prompt on a workstation or from within a login script or batch file as described in *Utilities Reference.*

- DOS menu-based utilities

  DOS menu-based utilities are executed by typing the name of the utitlity at a DOS prompt on a workstation.

- Graphical utilities

  Graphical utilities are run from within Windows environments.

Figure 3-2 lists all workstation utilities included with NetWare 4.11 / 4.2. Utilities that are new since NetWare 3.1*x* are listed in bold text. Utilities introduced with NetWare 4.11 / 4.2 are indicated with an asterisk.

The remainder of this section includes a brief summary of each utility that is new or updated since NetWare 3.1*x* .

Figure 3-2

Workstation Utilities

Workstation Utilities		
Graphical Utilities	**Menu-based Utilities**	**Commands**
NDS Manager *	**AUDITCON**	**ADDICON ***
NetWare Administrator	COLORPAL	**ATOTAL**
NetWare Application Launcher *	FILER	CAPTURE
NetWare Application Manager *	**NETADMIN**	**CX**
NetWare Directory Browser (Mac OS) *	**NETUSER**	**DOSGEN**
NetWare File Migration *	**NPRINTER**	FLAG
NetWare Login *	**PARTMGR**	LOGIN
NetWare Print Chooser (Mac OS) *	PCONSOLE	LOGOUT
NetWare Tools (OS/2)	PRINTCON	MAP
NetWare User Tools	PRINTDEF	MIGPRINT
NetWare Volume Mounter (Mac OS) *	RCONSOLE	NCOPY
NLS Manager *		**NCUPDATE**
NPRINTER (OS/2)		NDIR
NPRINTER Manager (Windows 95) *		**NLIST**
Remote Console (Mac OS) *		**NMENU**
SETUPDOC *		**NPATH**
		NPRINT
		NVER
		NWSTART (OS/2) *
		NWSTOP (OS/2) *
		NWXTRACT
		PSC
		PURGE
		RENDIR
		RIGHTS
		SEND
		SETPASS
		SETTTS
		SYSTIME
		UIMPORT
		WHOAMI
		WSUPDATE
		WSUPGRD

BOLD = New to NetWare 4

*** =** New to NetWare 4.11 /4.2

New Workstation Utilities

Table 3-3 summarizes the workstation utilities that are new since NetWare 3.1*x*.

Table 3-3
New Workstation Utilities

New Workstation Utility	Description
AUDITCON	Enables you to audit file system and NDS events on the network.
ADDICON	Use at the DOS prompt or in login scripts to add icons to a Windows 3.1*x* Program Manager group.
ATOTAL	Use to total the accounting charges on your network.
CX	Enables you to change your context in the Directory tree.
DOSGEN	Use to boot a DOS workstation from remote boot image files on the server (rather than booting from a local drive).
NCUPDATE	Enables you to update a NET.CFG file with a new name context after a container object has been moved or renamed.
NDS Manager	Enables you to create, manage, and repair Directory partitions and replicas. (Includes a superset of the features in the menu-based PARTMGR utility; replaces the graphical Partition Manager utility available with previous releases of NetWare 4.)
NETADMIN	This DOS menu-based utility provides a subset of the functionality available in the graphical NetWare Administrator utility.
NETUSER	Enables you to perform network tasks, such as setting up print jobs, managing drive mappings and attachments, and sending messages to other network users. (Replaces the SESSION utility.)
NetWare Administrator	This graphical utility enables you to create and manage Directory objects, set up and manage network printing, manage partitions and replicas (via the integrated NDS Manager utility), and manage licensing services (via the integrated NLS Manager utility). NetWare Administrator incorporates all the functions available in FILER, NETADMIN, PARTMGR, and PCONSOLE.

New Workstation Utility	Description
NetWare Application Manager™ and NetWare Application Launcher™	These utilities enable you to manage and access network applications as Directory objects, providing advanced application control and access by network users.
NetWare Directory Browser (Mac OS)	Use at a Mac OS-based workstation to choose objects from the Directory tree.
NetWare Login	Use at a Windows 3.1*x* or Windows 95 workstation to access a Novell Directory tree or server or to run a login script.
NetWare Print Chooser (Mac OS)	Use at a Mac OS-based workstation to choose and configure a Novell Directory Services printer or print queue.
NetWare Tools (OS/2)	Use to access network resources from an OS/2 workstation. NetWare Tools enable you to perform tasks such as mapping drives, managing printer connections, managing the Directory tree, managing server connections, displaying network users, and sending messages.
NetWare User Tools	Enables Windows 3.1*x* users to manage their network environment, including drive mappings, printing, sending broadcasts, and Directory access.
NetWare Volume Mounter (Mac OS)	Use at a Mac OS-based workstation to mount a NetWare volume.
NLIST	Enables you to view information about files, directories, users, groups, volumes, servers, and queues.
NLS Manager	Use to manage NetWare Licensing Services (NLS).
NMENU	Enables you to create a working environment for network users. This version is easier to use and requires less memory than previous versions.
NPATH	Enables you to determine the search sequence that NetWare uses to find message files so you can troubleshoot why a user's workstation can't find a particular file, why the workstation is finding an incorrect version of a file, or why the workstation is displaying a foreign language.
NPRINTER	Enables a printer attached to a DOS or Windows 3.1*x* workstation to be a network printer.
NPTWIN95	Enables a printer attached to a Windows 95/98 workstation to be a network printer.

New Workstation Utility	Description
NWSTART (OS/2)	Starts NetWare Client for OS/2 on an OS/2 workstation if the DISCONNECT ON parameter is included in the NET.CFG file. The DISCONNECT ON parameter prevents NetWare Client for OS/2 from making a network connection when the workstation is started.
NWSTOP (OS/2)	Disconnects NetWare Client for OS/2 without turning off your computer.
NWXTRACT	Use to extract and copy files from the *NetWare Installation* CD-ROM to the network or to local drives.
PARTMGR	Use to create and manage partitions and replicas of the NDS database. This utility provides a subset of the features available in the graphical NDS Manager utility.
Remote Console (Mac OS)	Use to view and control one or more server consoles from a Mac OS-based workstation.
SETUPDOC	Use at a Windows 3.1*x* workstation to install and delete document collections and DynaText* viewers, to configure viewers to access document collections in various ways, and to create viewer icons at individual workstations.
UIMPORT	Enables you to import data from an existing database into the NDS database.
/VER	Enables you to view the version number of a utility and the files the utility requires.
WSUPGRADE	Enables you to upgrade the IPX LAN driver on the workstation to the corresponding Open Data-Link Interface™ (ODI™) driver.

Consolidated Workstation Utilities

Table 3-4 summarizes the workstation utilities that have been consolidated since NetWare 3.1*x*.

Table 3-4
Consolidated Workstation Utilities

NetWare 3.11 Utilities	NetWare 4 Utilities
ALLOW, GRANT, REMOVE, REVOKE, RIGHTS, TLIST	RIGHTS
ATTACH, LOGIN	LOGIN
BINDFIX, BINDREST	(Use DSREPAIR at the server console.)
CASTON, CASTOFF, SEND	SEND
CAPTURE, ENDCAP	CAPTURE
CHKDIR, CHKVOL, NDIR, LISTDIR, VERSION	NDIR
DSPACE, SECURITY, SYSCON, USERDEF	NETADMIN
FCONSOLE	(Use MONITOR at the server console.)
FILER, SALVAGE, PURGE, VOLINFO	FILER
FLAG, FLAGDIR, SMODE	FLAG
MAKEUSER	UIMPORT
MENU	NMENU
NBACKUP	SBACKUP
SESSION	NETUSER
SLIST, USERLIST	NLIST

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