



# Tech Info Library

## Macintosh-To-Novell NetWare With AppleTalk (Part 2 Of 3)

Article Created: 25 May 1988

### Article Change History

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02/01/93 - REVISED

- To add information about volume limits of 1MB less than 2GB under EXPANDABILITY.

This is the second of three parts.

### About The NetWare Operating System

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NetWare is the foundation of Novell's product line. It was introduced in 1983, and is now in its seventh generation of development. NetWare offers tremendous connectivity, expandability, and communications capabilities.

NetWare Operating System Software supports 45 popular LAN hardware configurations.

### Compatibility

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NetWare is compatible with virtually all PC networking software and hardware.

### NETWORK HARDWARE

NetWare supports every major network topology and every major manufacturer's hardware (including IBM's PC and Token-Ring networks, AT&T StarLAN, ARCNET, and many Ethernet-type networks). NetWare preserves current hardware investments and lets clients choose the hardware that best suits their price/performance needs. Best of all, the NetWare user interface remains the same regardless of the hardware it is running on.

### COEXISTENCE WITH NON-NETWARE PRODUCTS

NetWare can coexist with many non-NetWare products, such as packages developed by IBM for PC-to-mainframe communications. Since both NetWare and non-NetWare products can run on the same network simultaneously, clients are not limited to using only NetWare on a NetWare network. For example, using the TCP/IP Gateway Option, a file server can use both

NetWare and TCP environments simultaneously. NetWare also supports important new products being developed by IBM (APPC/LU 6.2 protocols) and other vendors.

#### CONNECTIVITY

NetWare lets clients interconnect networks through either gateways or bridges. Bridged networks communicate and share information in a way that is transparent to the user. This lets clients purchase networks or add networks, as necessary, without making the original hardware obsolete. Connectivity protects investments in training, software, and hardware.

#### EXPANDABILITY

NetWare networks can grow easily when the single network limit is reached, clients can simply bridge the network to another network and continue adding workstations and file servers.

It is easy to increase the disk storage and memory capacity of a NetWare network. Disk subsystems may be added to increase hard disk storage capacity to as much as to 2GB. Currently, we have found that a partition size at least 1MB smaller than 2GB seems to work acceptably. Larger volume sizes might cause negative file sizes, inability to copy files because "More space is needed" even though plenty of space is available. You might encounter these symptoms when Novell servers publish volumes larger than 2GB over the network.

Because NetWare can run in protected mode on 286-type file servers, NetWare supports up to 8MB of Random Access Memory (RAM). Additional RAM improves hard disk performance.

#### DISTRIBUTED PROCESSING

Under NetWare, each workstation is an independent computer performing its own processing. The file server manages the shared resources and coordinates network activity but does not actually process data. This method of managing data is called "distributed processing".

Because each workstation has its own processing power, adding PCs to the network does not decrease the file server's performance. In contrast, terminals connected to mini and mainframe systems share the processing power, which decreases the power available to each user.

#### OPERATING SYSTEM TECHNIQUES

Reading from and writing to the file server hard disk occurs more frequently than any other network task. NetWare is specifically designed to perform fast file reads and writes. Other performance enhancements include:

#### SINGLE-TASKING VERSUS MULTITASKING

NetWare is a multitasking operating system. Performance degradation in the

single-tasking environment is magnified with every workstation on the network. Unlike single-tasking operating systems such as DOS, NetWare can service many workstation requests and many hard disks simultaneously.

#### DIRECTORY HASHING

NetWare minimizes file searching time by efficiently organizing information. Specifically, NetWare indexes directory entries so it can quickly find a file (similar to the way that dictionary entries are alphabetized to enable the user to locate the entry at once).

#### DIRECTORY CACHING

NetWare saves time by putting a copy of each directory in the file server's RAM. RAM access is much faster than hard disk access, so directory caching significantly increases network performance. Since the disk is accessed less frequently, directory caching also helps eliminate disk-related bottlenecks.

#### FILE CACHING

NetWare continually tracks parts of files used most often and stores them in RAM. NetWare increases performance by anticipating subsequent requests and reading large blocks of information into RAM. This increases performance by saving "seeks" to the disk, which reduces access time and helps eliminate bottlenecks.

#### ELEVATOR SEEKING

The disk read-write head travels across the disk and picks up files in its direction of travel, much like an elevator taking floor requests. When a head reaches the end of the disk, it goes in the other direction, picking up new requests. This significantly decreases disk wear and tear and increases disk throughput by up to 50%.

#### Security

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A network supervisor controls network security, which may be implemented on the file server, directory, and file levels. Access to network resources is based on user profiles that the supervisor assigns. Individuals can also protect their personal data without the assistance of a network supervisor.

#### Value-Added Processes

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NetWare offers an elegant solution for developers who would like to place value-added servers and services on the internet. A common File Service Interface provides for the implementation of value-added processes (VAP) in NetWare servers and bridges. Value-added processes bring new services to Advanced NetWare--namely, specialized servers, the incorporation of third-party devices and specialized technologies. Examples of VAPs are data base servers, communications servers, and print servers.

MHS

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Message Handling Service (MHS) is a value-added service that provides message transfer and routing services for LAN-based applications. NetWare MHS moves messages between PC LAN, minicomputer, and mainframe environments throughout a dispersed wide-area network. In the future, MHS will support protocols such as X.25, HDLC, SNA, SDLC, and more.

Continued in "Macintosh-To-Novell Netware With AppleTalk, Part 3 of 3."  
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Keywords: <None>

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19960215 11:05:19.00

Tech Info Library Article Number: 2951