# File / Printing



## CD HELPdesk Series: Novell Products

Click on any icon for more information

Q+A     PROCEDURE LIST     NETWORK UTILITIES

DEMOS     VENDOR LIST

## File / Printing Q & A

## Printing Q & A: Print Queue Notification



**Is there a way I can be notified of a problem with a print queue when I am logged into my server?**



Yes. Add your user ID to the List of Print Queue Operators in PCONSOLE. When a queue is off-line, you will receive a message.

## Printing Q & A: Print Jobs Split into Two

**When I print a large file, it splits into two print jobs. Why? How do I fix it?**

It sounds like you need to increase the Timeout (TI=) parameter in your CAPTURE or NPRINT statement. The syntax of the command is:

    CAPTURE S=AUS101 Q=LASER1 NT NFF TI=X

in which X is a value between 0 and 1000.

The TI parameter permits printing from an applications that don't signal the end of a job without having to exit the application. The number indicated in the parameter represents the amount of time in seconds to wait after an application has finished writing to the file before sending the print job to the print queue.

Setting this value too low (other than zero) can cause print jobs to be split in two.

Setting this value to 99 usually corrects this problem. Alternately, you can set this value to 0 to indicate No Timeout.

No AutoEndCap (NA) is another parameter you may need to add to the CAPTURE/NPRINT statement. The default is AutoEndcap for CAPTURE/NPRINT if none is specified. The AutoEndcap is an End-of-Job marker sent by the NetWare shell whenever an application returns to DOS.

# Printing Q & A: CAPTURE Error Message



**When I run CAPTURE, I receive the message "CAPTURE: No default queue found." What is happening and how do I fix it?**



Both CAPTURE and NPRINT have a parameter to designate a print queue name in the command line. When a request to print is issued, the file is spooled to a directory on the file server, depending on the name of the print queue specified. Each queue represents a different directory on the file server. Once the print server indicates that the specified printer is able to accept the print job, the file is removed from the directory on the file server and sent to the print server. The parameter that CAPTURE and NPRINT use to designate the queue name (Q=queuename) defines where the file will be sent as in the following example:

    CAPTURE L=1 S=AUS101 Q=LASER1 NT
    NPRINT H:MARY.TXT S=AUS101 Q=LASER1

In the examples above, output will be sent to the LASER1 queue in both cases. If no queue name is specified, both CAPTURE and NPRINT look in PRINTCON to see if a default job configuration has been defined.

If there isn't a default job configuration set in PRINTCON, then both CAPTURE and NPRINT check the file server for a SPOOL 0 designation. SPOOL is a console command that maps a printer number to a printer queue.

There are several ways to prevent this error message from occurring again. Before proceeding, though, you need to check to make sure that you have a proper queue defined. This can be done using PCONSOLE in NetWare v3.x or NETUSER in NetWare 4.x. Once you are assured that the print queue exists, you can do any of the following:

1.  Add the proper queue name to the command line: this insures that the output goes to a specific printer (CAPTURE Q=LASER1).

2.  Invoke the PRINTCON utility and select the menu option SELECT DEFAULT PRINT JOB CONFIGURATION. This brings up a screen that includes a queue name field along with other default print information. Here you can enter a queue name that will remain as the system default. Issuing a CAPTURE or NPRINT command without specifying a queue name will cause the output to be redirected to the print queue specified here. This works fine for a small network with only one or two printers in close proximity. However, for large

networks, users will need to be notified about where this default queue is located.

3.  At the file server console, use the SPOOL command to map a network printer number 0 to a printer queue. This also sets a system default, so don't forget to notify your users about where it is.

## Printing Q & A: Delayed Printing

**Several of our remote printers are taking 30 seconds or longer before user jobs begin printing. Is there some way I can speed this up?**

When you issue the CAPTURE command, you might want to use a time-out value of 10-15 seconds. There is no right or wrong setting for this option. The value you use is partially driven by applications being used. If an accounting application is printing and performs calculations or has to "think" while printing, a longer time-out value should be used to keep from generating multiple pages on the print job. If network printing is slow in general, make sure you have the latest version of RPRINTER and use it in polled instead of interrupt mode.

## Printing Q & A: Garbled Characters

**I have a Hewlett-Packard LaserJet 4 printer connected to the server's LPT port. When I print from an application over the network, I experience problems with garbled printouts, printer buffer overruns, and out of memory errors on the printer. If I connect the printer directly to a PC and print from the same applications, everything is fine. What can I change to make the printer work across the network?**

The first thing to check is that your CAPTURE command has the NT option specified. NT stands for No Tabs and prevents NetWare from trying to interpret the print job. When printing from within Microsoft Windows, it is a good idea to turn off fast printing to a port. For that matter, you may want to turn off the Windows print manager entirely and let the server handle spooling the print job. You may need to turn off use of interrupts in PCONSOLE for the server's parallel port. Not all LPT ports handle interrupts in a way that NetWare expects them to, and this can occasionally be the cause of the problem. You may also want to increase the size of the print buffer for this port. Doing this shouldn't have an adverse impact on the server.

## Printing Q & A: Random Graphics

**I am having problems with odd characters showing up in documents that have a graphics item in the file. Someone recommended I get the latest PSERVER.NLM and RPRINTER.EXE, but they haven't fixed the problem. Do you have any suggestions?**

On your CAPTURE command line, make sure you specify the NT (No Tabs) option. In the Windows Control Panel, disable the tabs. This option keeps NetWare from interpreting the print job and sends it straight to the printer the way it was received. Also, make sure you have the correct printer driver specified in your applications. Sometimes a "compatible" driver may not be 100 percent compatible with an application. To be on the safe side, make sure the workstation has been updated with the latest files (e.g., LSL.COM, IPXODI.COM, the LAN driver, etc.).

## Printing Q & A: Eagle Technologies NPE400



**I have an Eagle Technologies NPE400 external print server. Having read the manual, I don't see that it is compatible with NetWare 4.10. Is this true?**



In terms of being compatible with NetWare 4.10's <span style="color:green">NetWare Directory Services</span> (NDS), this is true. Several companies are starting to introduce external print servers that are NDS-aware. You should still be able to use the NPE400 with the NetWare 4.10 file server in <span style="color:green">bindery emulation</span> mode. It would be a good idea, after creating the necessary print services information on the server, to switch <span style="color:green">PCONSOLE</span> to bindery emulation mode to see how your printer naming looks.

# Printing Q & A: Slow Printing from PSERVER.NLM

**I am experiencing slow printing on a NetWare v3.x server using PSERVER.NLM. Only a few characters are printing every few seconds. What is wrong?**

The cause of the problem could be the parallel port on your server. Not all LPT ports handle their interrupts in a manner that NetWare expects. Go into PCONSOLE and turn off the use of interrupts for that printer. For this change to take effect, you will need to unload and reload PSERVER.NLM at the file server console. If you are still having problems, try raising the printer buffer for this printer to 20 kilobytes (KB) in PCONSOLE. It would also be a good idea to download the latest version of PSERVER.NLM from NetWire, as earlier versions had problems.

# Printing Q & A: Spooler Errors

**When I try to print a large report to a printer, I get the message "Shell: Network spooler error, probably out of space on vol SYS:." What causes this error message and what can I do about it?**

You will see this error message when the SYS volume is low on or completely out of disk space.

It's important to know what happens when a user requests an application to print. First, the application sends the file to its printer driver, where it is prepared in the printer's format. The request to print is intercepted by the network shell and redirected to the file server. The network spooler sends the file to a specific location on the file server, where it is kept until the print server is ready to service the print job.

The network spooler stores the print job on the file server's SYS volume only in NetWare versions v2.x and v3.x. In NetWare 4.x, the administrator is able to choose the volume in which print jobs are stored. For this problem, we're concerned with v2.x and v3.x, in which the print job is stored on the SYS volume.

If the network spooler attempts to send a file to the SYS volume and the SYS volume is out of space or low on space, you will receive this error. To solve this problem, first check the amount of available disk space on the SYS volume. If you are low on space, you will need to add more disk space to your SYS volume.

If you have another volume on your file server, you should first back up your existing data, then increase the volume size by adding more physical disks or by stealing space from the other volume. Then, you'll need to restore your data on your new volume. You should not attempt to do this without first reading your manuals.

If you don't have a volume besides SYS, you can add more disk space to the existing SYS volume without having to take the server down. However, experience reminds us that even the simplest task can lead to disaster. We recommend that you never attempt anything that involves data without first backing up your server.

In addition, since there's always a possibility that you may experience downtime or have to restore data from tape, this may be something you wish to perform after hours.

# Printing Q & A: PSERVER Not Authorized for Queue Name

**When I load PSERVER.EXE, I get the error message "PSERVER: Not authorized for queue name." What is happening and how do I fix it?**

This error message indicates that you have already defined the print queues and the print server. However, the final step is to assign print queues to the printers themselves.

A print server is the manager of the printers and print queues. It knows which printers service which queues. A print server continuously polls the file server's queues to see if there are any jobs to print. If it finds a job waiting in the queue, it then checks the printer to see if it's ready. Then it removes the print job from the queue on the file server and sends it to the printer to be serviced.

As you can see, this takes a lot of coordination on the print server's part. The print server must know which queues belong to which printers before it can perform these management tasks.

At this point, you have defined the print server and told it which printers it will manage. And you've created the queues that create the subdirectories on the file server. Now you must link the queue to the individual printer, which then authorizes the print server to manage and service those queues.

To do this, run PCONSOLE. Select Print Queue Information from the menu. You should see a list of print queues that you have already created. Select the queue you want to link to this print server and press the Enter key. Under the Queue Servers box, you'll see that the print server in question is not listed. Press the Insert key and add the print server to this list.

Now bring up the print server and see if the error message is gone.

# Printing Q & A: Remote Printer Loses SPX Connection

**I have a remote printer on my network. Sometimes I receive the message that the print server has lost its SPX connection. To get the connection back, I need to reboot the workstation attached to the printer. What can I do to solve this?**

You will need to modify the following two parameters in your NET.CFG file: IPX Retry Count and IPX Abort Timeout. Novell recommends that you double the values of those two parameters.

Remote printers use Sequenced Packet Exchange (SPX) connections instead of Internetwork Packet Exchange (IPX) connections. Some applications that use SPX connections set an SPX Retry Count. If an application does not set an SPX Retry Count (like RPRINTER), NetWare defaults to the values set for IPX Retry Count and IPX Abort Timeout.

# Printing Q & A: Blank Pages after Print Jobs

**When my users print to the network printer, their jobs are always followed by a blank page. What is happening and how do I stop it?**

Form feeds sent after an application prints can cause the blank page you describe. For example, if the user's print default is set to print a form feed with every print job, then a page will be ejected after the application has completed its printing.

The main use for causing a page to eject by forcing a form feed was for those applications that were not network-aware, but were printing on the network. This happened around the time LAN use exploded, but before all applications were written for the network.

On single-user applications, the application expected that it would print to a local printer attached to the PC and that the user would be within arm's reach. Since those applications thought they had exclusive use of the printer, they did not bother to issue a form feed after printing, because the user could reach over and manually hit the form feed button on the printer. So, if an application had 1.5 pages to print, the first page would pop out of the printer, but the second page would stay in the printer, waiting for more data to be sent to fill up the page. The printer's form feed light would flash to notify the user. If the user sent another print job and the application did not issue a form feed before starting to print, then that print job was merged and printed with the previous job. Multiply this effect by the number of users sharing a printer on a network, and you could have jobs printing on top of one another.

NetWare permits the LAN administrator to turn the form feed option on or off. If you're still using single-user applications and printing on the network, you will probably want to set form feed to on. If your network contains only network applications, you should be safe turning off the form feed because those applications send a form feed after printing.

The CAPTURE and NPRINT utilities permit a command line parameter that allows the user or administrator to turn off the form feed: NFF. For example, a CAPTURE statement turning off the form feed might look like this:

    CAPTURE S=AUSTIN Q=HP1 NT NFF

in which NFF stands for No Form Feed. The CAPTURE statement can be found

in the system login script or <span style="color:green">user login script</span>. If you want to set this parameter globally, you can use the NetWare utility <span style="color:green">PRINTCON</span> to set global configuration options.

# Printing Q & A: PSERVER and IPX Connections

**I have a 20-user NetWare LAN with 20 users. After I installed the printer on this LAN, only nineteen users can log in. What is happening and how do I fix it?**

It's important to remember that when you say "20-user" LAN, you are talking not about the number of users that can log in, but about any device that uses an IPX connection number.

Print servers using PSERVER.EXE take an IPX connection. Therefore, your 20-user license now means nineteen users and one PSERVER connection. If you issue the USERLIST command, on some versions you'll see the print server in question listed. That's because it is considered a connection to the file server's connection table.

To fix this problem, you could switch to the PSERVER NetWare Loadable Module (NLM) that is loaded on the file server. NetWare assigns PSERVER.NLM a connection number above the connection table. In your case, that connection number might be 21.

Alternately, you could switch to RPRINTER or NPRINTER. These utilities allow printers to be attached to a workstation that is logged into the network. These printers are designated as remote printers on the network and only use SPX connections. However, before going this route, you should access CompuServe and explore some of the known problems and fixes associated with the use of RPRINTER or NPRINTER.

Also, don't forget that one user logged in twice to the file server counts as two connections on that file server.

# Printing Q & A: Capturing Information and Workstation Hangs

**When I perform a Ctrl-Print Screen, my workstation hangs. What is happening and how do I fix it?**

Based on the information you've given us, we'll have to look at two different scenarios. Scenario 1 is that you have a printer attached to your workstation and are not able to get that printer to work. Scenario 2 is that you do not have a local printer attached and you're trying to perform a print screen to a network printer.

First, let's look at what happens when you issue a Ctrl-Print Screen, whether you're connected to a local or network printer. DOS takes the display contents of the screen and passes the information to the workstation's primary parallel port or LPT1. The expectation is that the printer connected to that port will receive the print job.

Scenario 1: When a workstation hangs after pressing the Ctrl-Print Screen, it means that the workstation doesn't find anything connected to its parallel port. This could happen because the printer is off-line or because the cable from your workstation to the printer is not connected properly (i.e., to LPT2). You might also want to make sure you have a proper parallel cable.

One other interesting thing that has caused a Ctrl-Print Screen to lock up a PC is EMM386. If you are at your last resort, try disabling EMM386 in the CONFIG.SYS file and try again. The EMM386 driver can sometimes conflict with certain machines.

Scenario 2. On a workstation connected to a network, a Ctrl-Print Screen works the same way, except since there is no printer attached to the parallel port, the print request must be intercepted and redirected onto the network. This is accomplished by issuing a CAPTURE command prior to printing on the network. Examples of two basic CAPTURE statements are shown below:

```
CAPTURE L=1 Q=LASER1 NT TI=15
CAPTURE Q=LASER1 NT TI=15
```

Note that in the first example, L=1 is one of the parameters. This means that this CAPTURE statement is defining LPT1. The statement could read L=2, which would define LPT2. However, for print screen purposes, we are only concerned with LPT1.

Note also that in the second example, there is no L=1 parameter. This is because the CAPTURE default, without any L= specified, is L=1. Some people prefer to add this parameter in, even though it is not necessary.

Once you've redirected your local LPT1 to a network printer, your workstation will no longer hang and you should receive the output at a network printer.

If you do not have a local printer attached, you could add the following line to your NET.CFG file. It will prevent your workstation from hanging if you accidentally issue a Ctrl-Print Screen before issuing a CAPTURE command:

    LOCAL PRINTERS = 0

## File Q & A: Elevator Seeking

**What is elevator seeking and how does it work?**

The name elevator seeking was chosen because the concept is similar to the way an elevator works in a building. Let's say persons A, B, and C get on an elevator. Person A presses the 8th floor button, person B presses the 6th floor button, and person C presses the 7th floor button. If the elevator were to process those requests on a first-come, first-served basis, it would travel first to the 8th floor, then down to the 6th floor, and then back up to the 7th floor. That route would be an inefficient one, since it would bypass the 7th floor twice before actually stopping. Elevators were designed so that the order would be 6, 7, and 8. Also, if there were any passengers to pick up on the 1st through 5th floors, the elevator would stop on its way to the 6th floor.

NetWare's elevator seeking is designed to maximize the efficiency of disk read/write request passing through the disk channel in much the same way as the elevator in the example above. NetWare queues each request it receives to read or write to the file server's disk. This queue is stored in the file server's disk device queue. The request to read or write to disk is not processed on a first-come, first-served basis. Instead, NetWare orders the disk device queue so that the disk head picks up or deposits information as the disk head a passes over the disk, regardless of the order in which the request was received.

# File Q & A: Definition and Enabling of Hot Fix Redirection

**What is Hot Fix and how does it work? Where do I enable Hot Fix on my server?**

At installation time, NetWare reserves 2 percent of its hard disk space (called the Hot Fix Redirection Area) for redirection of blocks of data. After NetWare writes a block of data from memory to disk, it reads the data from disk and compares it with the data in memory. If the two are the same, NetWare assumes the write operation was successful. However, if the two data blocks are different, NetWare assumes that there is a bad area on the disk. NetWare's Hot Fix feature is invoked and the data block in memory is redirected to the Hot Fix Redirection Area on the disk. In addition, NetWare records the bad block in a section of the Hot Fix area that is reserved for that purpose. Once this information is recorded, the server will not attempt to use the bad block in future write operations. The feature is called Hot Fix because the whole process happens on the fly, transparent to the user community. This read-after-write verification process can be controlled through a SET parameter at the file server console:

    SET ENABLE DISK READ AFTER WRITE VERIFY=ON/OFF

The default is set to ON when NetWare is installed.

NetWare allocates the 2 percent Hot Fix space in 4 kilobyte (KB) block sizes. The size of the Hot Fix area is directly proportional to the size of the hard disk attached. NetWare automatically creates the Hot Fix area at installation time, but permits this amount to be modified by a network administrator. However, changing the Hot Fix size on a server that contains data is only advisable if a backup is performed, because changing partition size or Hot Fix information wipes out existing data on a disk. In NetWare v2.x, this Hot Fix area is located physically on the last 2 percent of the physical disk partition; in v3.x and above, the Hot Fix area is located in the first 2 percent of the physical disk partition.

**What happens if Hot Fix fills up?**

Hot Fix is always active unless there is a disk failure or the Hot Fix area fills up. The administrator should monitor the percentage of the Hot Fix area being used. A growing Hot Fix area is representative of a hard disk with a lot of bad blocks on it.

**How can I look at my Hot Fix?**

Loading MONITOR from the server console, <span style="color:green">RCONSOLE</span> from a workstation, or SERVMAN allows the network administrator to view Hot Fix information.

## File Q & A: MAP Command Use

**How do I use the MAP command?**

The MAP command is primarily used to create or remove a logical drive letter pointer (called drive mapping) to a location on a network like a directory or subdirectory. For example, the drive letter G might be assigned to represent a specific subdirectory on a NetWare volume. The pointer is intended to provide a convenient way for a user to access a location on the network by simply typing in a representative letter instead of a long, extended path name. A user is permitted to have twenty-one drive mappings, from F to Z, with sixteen of those being search drives (S1-S16).

Search drives are similar to the PATH statement often found in an AUTOEXEC.BAT file. When you execute a command, either a NetWare command (CAPTURE.EXE) or an application command (WP.EXE), the NetWare operating system first looks in the current directory from which you executed the command to find the file associated with the command. If NetWare does not find the associated file to execute, it begins to search for the file by looking at the first search drive's path and then proceeding through all the search drives' locations until the proper file is found.

Drive mappings can be set temporarily for the current login session, or they can be set permanently in one of the login script files (system, profile, and login).

The following is the basic syntax for the MAP command (followed by two examples) used to set a temporary drive mapping (i.e., from a DOS command prompt):

MAP [option] Drive_Letter: [=  Server_Name\Volume_Name:\Path_Name]

MAP G:=AUS101\VOL1:\USERS\MADDEMT

MAP DEL G:

In the example, G is mapped to represent the location AUS101\VOL1:\USERS\ MADDEMT on the network. Each time a user wants to access that subdirectory, he or she would simply use G instead of the extended path name.

Note that you do not have to include the Server_Name, unless you want to map a drive to a server you are attached to. NetWare defaults to the current server

unless you specifically state another server in your drive mapping.

In the second example, we added in the DEL option; notice how the syntax changes. Using the MAP command in this way removes the drive mapping that we just assigned for G. A drive mapping must exist before you can issue the DEL command to remove a specific drive mapping.

Below is a list of the options:

| | |
|---|---|
| INS[ERT] | Creates or changes a search drive mapping |
| DEL[ETE]/REM[OVE] | Deletes or removes a drive mapping |
| N[EXT] | Maps the next available drive |
| ROOT | Creates a fake root |

Here's an example of each of the above options (except DEL, which we've already done):

    MAP INS S1:= AUS101\APPS\DATABASE

This MAP command instructs NetWare to assign the first search drive to the DATABASE subdirectory on the APPS volume. This means that the user can invoke any application commands located in that subdirectory, from any directory on that file server. NetWare assigns search drives in reverse alphabetical order.

    MAP NEXT AUS101\APPS\DATABASE

This MAP command instructs NetWare to assign the next available drive letter to this subdirectory location. NetWare begins with F and searches all the way to Z, looking for the first drive that has no assignment.

    MAP ROOT G:=AUS101\APPS\DATABASE

This MAP command instructs NetWare (v3.x and above) to create a fake root. A fake root is sometimes required for applications or for security reasons. Certain applications require that they be installed in the root of a volume. However, a network administrator might have a specific directory scheme, in which he or she is placing all applications in certain subdirectories on the network. Creating a fake root fakes the application into thinking it has been installed at the root.

MAP ROOT also prevents users from accessing any directories above the directory that is mapped. In other words, a user could not issue a "CD.." (change directory) command.

## File Q & A: File Compression



**Can you explain how NetWare's file compression works?**



NetWare 4.x provides compression at two different levels: the server and the volume. At the volume level, files and directories are affected. The volume compression can be set from the INSTALL.NLM and during installation defaults to COMPRESSION = ON. Once this option is installed on a volume, it can not be removed arbitrarily. The volume must be deleted and recreated to disable the compression.

Once you've set COMPRESSION = ON for a volume, there are two attributes associated with the file and directory levels and two status attributes.

**File/Directory Attributes**

1. IC--Immediate Compress--a file and/or directory is marked for immediate compression.

2. DC--Don't Compress--do not compress files or directories.

**Status Attributes**

1. C--Compress--The operating system was able to compress the file  and/or directory.

2. DC--Don't Compress--The operating system was not able to compress     the file and meet a certain compression percentage. In other words, no advantage was seen in compressing the file.

3. CC--Cannot Compress--The file could not be compressed.

The next step is to enable compression at the server. This involves setting some SET parameters that define how you want file compression to work on your server. For example, you must set the time interval for when compression will be performed each day. This is done by two separate SET statements:

COMPRESSION DAILY CHECK STARTING HOUR

COMPRESSION DAILY CHECK STOP HOUR

In addition, you will set another parameter:

DAYS UNTOUCHED BEFORE COMPRESSION=n

which indicates how many days must pass since the file has been accessed before it becomes a candidate for compression.

Once you've set these three SET statements and you've set the compression information at the volume level, the server is ready to begin. It first checks the start time you indicated to see if it's time to begin the scan. If so, the server begins to scan files that haven't been accessed in the number of days you indicated. If it finds a file that meets your criteria, it checks to see if the file is a candidate to be compressed. This means that the file should not have the attributes DC (Don't Compress) or CC (Can't Compress).

Once a file passes these two checkpoints, the system makes one final check before it compresses the file. The system checks to see how much disk space will be saved by compressing the file: The set parameter for this is the following:

MINIMUM COMPRESSION PERCENTAGE GAIN=x

in which x represents the percent of the file size to be saved. If x percent of the file size can be saved, the system is given the green light to compress the file.

The server continues in this fashion until it reaches the time set in the COMPRESSION DAILY CHECK STOP HOUR.

Use NDIR or FILER to view the file compression statistics and FLAG to view the attributes (IC, DC, CO, and CC).

For a more detailed explanation, see Novell's AppNotes, "Compression and Suballocation in NetWare 4," June 1994, and "Exploring Hard Disk Compression," August 1993.

# File / Printing Procedure List

[How to Set Up Print Services for Server-Based Printers](#)

[Using PCONSOLE to Create Print Services](#)

# Using PCONSOLE to Create Print Services

1. Log in as ADMIN or equivalent.

2. Execute PCONSOLE.

3. Select Quick Setup.

4. Enter the print server name. It should be this format: PS organization name or organizational unit name.

5. Add the new printer as P1. When you add subsequent printers, increase this name by increments of 1.

6. Add the new print queue name. It should be Q1. When you add subsequent queues, increase this name by increments of 1: Q2, Q3, and so on.

7. By default, print queues are saved in the SYS volume. You can change this if you want.

8. By default, the banner type is Text. You can change this to PostScript if you have that type of printer.

9. By default, the printer type is Parallel. Other options are Serial, UNIX, and AppleTalk.

10. The location of the printer is Manual Load, which indicates that the printer will be attached to a workstation and will use NPRINTER to make itself available for network use. If the printer will be attached to the server, you need to change this to Auto Load (local) to be able to invoke the NPRINTER.NLM.

11. The interrupt is set to None (polled mode). This option should be left as is unless you have problems with printing speed.

12. The port is LPT1 by default. Change this option only if your printer will be residing on LPT2 or COM1.

13. When you finish, press the Esc key and enter Yes to save.

14. At the file server console, enter LOAD PSERVER PS-ORGANIZATION NAME and press Enter. PSERVER.NLM will load and log in the printer to the network. It will take a non-licensed connection on the server for

PSERVER.NLM and a connection for each printer it will be servicing. You may want to enter this same load line in the server's AUTOEXEC.NCF file to allow PSERVER.NLM to automatically load each time the server comes online.

15. Invoke the CAPTURE command at the workstation or set up a CAPTURE statement in the NetWare client software you are using. Begin printing.

# How to Set Up Print Services for Server-Based Printers

1. Run the PCONSOLE utility from a workstation.

2. Select the Print Queue option and press the Enter key.

3. Press the Insert key, enter the print queue name, and press the Enter key.

4. Press the Esc key to return to the Available Options menu.

5. Select Print Server Information and press the Enter key.

6. Press Insert, enter the print server name, and press the Enter key.

7. Select a new print server name and press the Enter key.

8. Select the Print Server Configuration option and press the Enter key.

9. Select the Printer Configuration option and press the Enter key.

10. Select the first line labeled Not Installed and press the Enter key.

11. Change the name field to reflect the printer name and/or location of the printer and press the Enter key.

12. The type field for a server-attached printer should be parallel, LPTx, or serial, COMx (in which x is the port number). Select the appropriate choice and press the Enter key.

13. Press the Esc key, then answer Yes to save changes to return to the Configured Printers display.

14. Press the Esc key to return to the Printer Configuration menu.

15. Select Queues Serviced by Printer and press the Enter key.

16. Select the Printer Configuration menu in Step 10 and press the Enter key.

17. Press Ins to display a list of available print queues.

18. Select the print queue you created in Step 3 and press the Enter key.

19. Press the Enter key when the Priority Box appears on the screen.

20. Press Alt-F10 to exit PCONSOLE.

21. At the file server console prompt, enter LOAD PSERVER, followed by the print server name you entered in Step 6.

## File / Printing Requirements

**For server-based printers:**

- PSERVER.NLM (on NetWare v3.x and 4.x servers)

- NPRINTER.NLM (for each printer attached to a NetWare 4.x server)

- PSERVER.VAP (for NetWare v2.x servers or core printing services)

**For workstation-based printers:**

- PSERVER.NLM (on NetWare v3.x and 4.x servers)

- PSERVER.VAP (on a NetWare v2.x server)

- PRINTER.EXE (on a workstation on a NetWare v2.x or v3.x LAN)

- PRINTER.EXE (on a workstation on a NetWare 4.x LAN)

## File / Printing Network Utilities

AuditTrack v2.04 (Free 30-Day Trial) by On Technology Corp.

John T. McCann's SofTrack (Free 30-Day Trial) by On Technology Corp.

LPT120 from Dirk Engelhardt

NCAP11 by Darwin Collins

NENV10 and NLOGIN by Darwin Collins

NMENU335 by Dirk Engelhardt

SiteExpress from McAfee

Software Sentry by Microsystems Software

TCPRINT--Host TCP/IP Printer Server for NetWare

WHOHASIT by Andrew Cobb

WINMENU GE v2.4 for All Networks

WINMENU v6.04 for Novell 3.x Networks

## File/Print Utility: SiteExpress from McAfee

SiteExpress is a software distribution package for the enterprise network that lets a network administrator modify configuration files remotely and install software and operating systems such as DOS, Windows, Windows 95, and OS/2.

To install SiteExpress, copy the directory \PROGRAMS\MCAFEE\SITEXP to your hard disk. From the File Run option in Windows, type SETUP.EXE.

## File/Print Utility: Software Sentry by Microsystems Software



Software Sentry from Microsystems Software Inc. Is a license metering and software asset management package for any network, including NetWare.

To install Software Sentry, copy the subdirectory \PROGRAMS\MICROSYS to your hard disk. From the File Run command, type SETUP.

## File/Print Utility: NMENU335 by Dirk Engelhardt

NovMenu v3.35 is a menu system for NetWare.

To install it, copy the directory \PROGRAMS\NMENU335 to the SYS:SYSTEM directory on your file server.

## File/Print Utility: WHOHASIT by Andrew Cobb

WHOHASIT displays the files a workstation is using on a NetWare network, including volume use. It also allows you to send broadcast messages.

To run it, copy the directory \PROGRAMS\WHOHASIT to your hard disk. WHOHASIT is a Windows utility. To install it, type WHOHASIT.EXE from the File Run option in Windows.

## File/Print Utility: WINMENU GE v2.4 for All Networks

Requires Windows 3.1 or above.

Winmenu is a state-of-the-art menu program for Windows users designed to facilitate access to all applications and provide authorized access for the users. LAN sites that are contemplating to move to the   Windows environment will find Winmenu a must. Winmenu provides easy and intuitive access without the complications of the Program Manager. The greatest advantages of Winmenu are its ability to ease administration tasks and provide authorized access based on the group codes the user belongs to. It is cost-effective and looks great!

Please read the WINMENU.TXT file for more information.

To install it, copy the D:\PROGRAMS\WINMENUG directory to your hard disk.

Copyright by Ricky Freyre, 1995 / All rights reserved.
CompuServe # 70154,2635
Internet: 70154.2635@compuserve.com

# File/Print Utility: WINMENU v6.04 for Novell 3.x Networks

Requires Windows 3.1 or above.

Winmenu is a state-of-the-art menu program for Windows users designed to facilitate access to all applications and provide authorized access for the users. LAN sites that are contemplating to move to the   Windows environment will find Winmenu a must. Winmenu provides easy and intuitive access without the complications of the Program Manager. The greatest advantages of Winmenu are its ability to ease administration tasks and provide authorized access based on the group codes the user belongs to. It is cost-effective and looks great!

Please read the WINMENU.TXT file for more information.

To install it, copy the D:\PROGRAMS\WINMENUN directory to your hard disk.

Copyright by Ricky Freyre, 1995 / All rights reserved.
CompuServe # 70154,2635
Internet:   70154.2635@compuserve.com

# File/Print Utility: TCPRINT--Host TCP/IP Printer Server for NetWare

TCPrint is a printer server that resides on NetWare file server and complies with RFC1179 protocol for a Line Printer Daemon (LPD).

All hosts that support TCP/IP LPD protocol can assign their print jobs into the NetWare server's print queues directly via TCPrint. There is no additional software required for those hosts.

Users can assign their jobs transparently just as if they are printing on the host. All processes will be done by host and TCPrint.

Also, TCPrint performs UNIX to DOS ASCII text translation automatically.

It also provides LPQ and LPRM commands. Some UNIX systems didn't interpret job status data more than two lines long when the LPQ command was issued. Please contact the author if this situation occurs. This version has been tested for NetWare v3.x and 4.x. It doesn't need too much expertise for installation.

To install it, copy the D:\PROGRAMS\TCPRINT directory to your hard disk.

Please read the README.DOC file for more information.

# File/Print Utility: NENV10 and NLOGIN by Darwin Collins

This package documents the methods we use to automatically maintain the workstation network drivers, applications, and other workstation files.

It also includes NLOGIN.EXE, a NetWare 4.1 utility, that makes it easier for users to login to a NetWare 4.10 server. NLOGIN.EXE will search the user's 'short' login name in the NetWare Directory Services (NDS) tree and return the full NDS name so that it can be used for Novell's LOGIN.EXE. The purpose of this package is to aid other Network administrators in setting standards, batch files, and utilities and to make the maintenance of workstation network drivers and miscellaneous files painless.

For example, whenever, we receive a newer mouse driver, VLMUP*, or Windows 3.1 patches, we can easily distribute these files to all our workstations. (We usually test them for a week or two on one server before we copy them to other servers and sites).

However, for more complicated installations or anything to do with Windows, such as Lotus SmartSuite, Novell's WIN2NCS, CorelDraw, PCAnywhere, SPSS for Windows, or the Oracle client, we use a package called WinInstall 4.0. You can obtain WinInstall 4.0 by contacting us at (301)270-4458 or CompuServe 71371,635.

To install these utilities, copy the D:\PROGRAMS\NVEN10 directory to your hard disk.

Please read the README.TXT file for more information.

## File/Print Utility: NCAP11 by Darwin Collins

This printer redirection utility is designed to work with NetWare 4.10.

It displays to the network user a pick list of all allowable (accessible) network print queues and print job names, and allows the user to redirect his or her LPT ports to the desired choice. These choices can be saved by the user for later use. (e.g., activated upon network login). NCAP11 is fully compatible with NetWare 4.1's NetWare Directory Services. It does not use bindery emulation.

To install it, copy the D:\PROGRAMS\NCAP11 directory to your hard disk.

Please read NCAPTURE.TXT for more information.

## File/Print Utility: LPT120 from Dirk Engelhardt

The NovLPT Queue Handler is a resident print queue handler for NetWare. You can install it by copying the directory D:\PROGRAMS\LPT120 to your hard disk. From DOS, execute the file name LPTRES.EXE before starting Windows.

## File/Print Utility: AuditTrack v2.04 (Free 30-Day Trial) by On Technology Corp.

AuditTrack v2.04, a NetWare network auditing product, is a network surveillance system that allows LAN administrators to track and identify all login, file, remote access, and bindery activity occurring anywhere on a NetWare network.

To install this software, copy the directory D:\PROGRAMS\AUDITTR to your hard disk. Then run the SETUP program from the Windows Program Manager File Run command line. If your hard drive is designated as drive C, type C:\AUDITTR\ SETUP.EXE and choose OK.

## File/Print Utility: John T. McCann's SofTrack (Free 30-Day Trial) by On Technology Corp.



SofTrack, a software metering package, includes native support for Novell's NetWare Directory Services (NDS).

To install this software, copy the directory D:\PROGRAMS\SOFTRACK to your hard disk. Then run the INSTALL program from the Windows Program Manager File Run command line. If your hard drive is designated as drive C, type C:\softrack\install.exe and choose OK.

# File / Printing Demos

[Ontrack Data Recovery Slideshow](#)

## File/Printing Demo: Ontrack Data Recovery Slideshow

The Ontrack Volume Repair Detector package is designed to inform NetWare supervisors and system administrators about safe methods for recovering from NetWare volume corruption. The package contains two sections, a Novell NLM that detects the loading of VREPAIR, and a slideshow presentation that educates users on data security. The NLM warns supervisors to make certain that backups are adequate before attempting any repairs that could permanently damage critical files. The slideshow provides screen shots from the Ontrack Data Recovery for NetWare data recovery and protection utility.

To view the slideshow, run D:\PROGRAMS\ONTRACK\SLIDESHW.EXE from the File Run option of the Windows Program Manager.

++++++++++

## Directory Services

## Directory Services Q & A

[Definition of NDS](#)

[Differences between the Bindery and NDS](#)

[NDS Tree Structure](#)

[Partitions and Replicas in NDS](#)

[Time Synchronization](#)

[X.500 and NDS](#)

# Directory Services Q & A: Definition of NDS

**What is NetWare Directory Services (NDS)?**

NDS is a service provided by NetWare 4.x to keep track of resources and services on an internetwork. The information is stored in a hierarchical, distributed, object-oriented database (NDS database) that defines these available resources in a NetWare 4.x environment.

NDS provides a single point of management for network administrators. Users, groups, volumes, and servers are all objects in the NDS database. By definition, objects have properties with values that can include characters, numbers, video, and sound.

In addition to assisting the network administrator, users benefit in an NDS environment because they only have to log into the network once, but can access any service on the network (i.e., printers) that they have rights to. In previous versions of NetWare, the user had to log in (or attach) to each file server he or she desired a service from. This required the user to obtain and maintain a login ID and password on each file server. With NDS in NetWare 4.x, the user is authenticated once to the enterprise network and the services connected to the network.

NDS is derived from the Consultative Committee for International Telegraphy and Telephony CCITT X.500 standard, which defines a directory service implementation as any of the following:

1. Global--The user can access any service on the enterprise he or she has rights to.

2. Distributed--Information in the database is distributed.

3. Replicated--The same information is found in more than one location on the network.

## Directory Services Q & A: Differences between the Bindery and NDS

**How does the NetWare Directory Services (NDS) database in NetWare 4.x differ from the bindery databases in previous versions of NetWare?**

The bindery databases in NetWare prior to 4.x are flat-file databases that contain only text-based information about its resources. In addition, those bindery databases are maintained through a server-centric concept. This means that each server must contain its own bindery database for the resources it maintains. In this format, there is quite a lot of duplication. For example, a user defined on file server A must also be defined on file server B if he or she wishes to access resources (such as printers) on each server.

The user has to be authenticated on each server's bindery database before accessing those resources. This duplication is seen from the user's point of view as well as the administrator's. Before the user can log in to each of these servers, an administrator must access both servers and set up login IDs and rights for the user. On a small internetwork, this isn't much trouble, just redundant. On a larger internetwork, with 10 to 600 servers, this duplication quickly becomes a nightmare.

In NetWare 4.x, the NDS database replaces the bindery databases. It is object-oriented and can contain sound and video information as well as text-based information. The database is a global database that permits administrators to maintain information about network resources from a single point. It is not server-centric. An administrator can define a user's access to the network from the global database, as opposed to logging into each server's bindery database to define the user.

The NDS database can be replicated onto other servers so that if one server fails, the user's access to the network is still available. In previous versions of NetWare, if a server abnormally ended (ABENDed), all the resources connected to it became unavailable.

# Directory Services Q & A: X.500 and NetWare Directory Services (NDS)

**What is X.500 and how does it relate to NetWare Directory Services (NDS)?**

X.500 is a directory services standard recommended by the International Standards Organization (ISO) and the Consultative Committee for International Telegraphy Telephony (CCITT). The standard was first proposed in 1988 and later revised in 1992. The main goal was to create a global white pages directory in which separate systems could share the same information. For example, an e-mail system could share the information in the directory with a file server. NDS is derived from the X.500 recommendations, but is not a direct implementation of X.500.

NDS is only a derivative of X.500 because when NDS was in its beginning design stages at Novell, X.500 was only a proposed standard and did not include items like access control. Deeming items such as access control absolutely necessary in an internetwork, the NDS team decided to take portions from the architecture of X.500 and add network enhancements to NDS. Although NDS is only a derivative of X.500, it contains enough components of the X.500 architecture to permit interoperability with other X.500-based directories.

Adoption of the X.500 recommendations throughout the industry has been slow. You may hear terms such as specifications, recommendations, and standards when people talk about X.500. Regardless of the terminology you encounter, people are all talking about the same thing. Typically, a standards body recommends a set of specifications as a proposed standard. When the recommendations are approved, they become a standard. Depending on the timing of the publication that you are reading, you may see X.500 listed as a recommendation, specification, or standard.

# Directory Services Q & A: NDS Tree Structure

**What is the NetWare Directory Services (NDS) Directory Tree?**

The name tree was derived from the fact that the NDS database's objects are arranged in a hierarchical tree-shaped structure. The objects in the NDS database represent information about resources on the internetwork such as servers, printers, and users. Each object has associated properties that contain information specific to the object. For example, a user object might contain up to ten properties, such as LOGIN ID, FIRST NAME, or LAST NAME, while a server object might contain only five properties, which are completely different. Properties of objects have a value associated with them.

The NDS Directory Tree contains three types of objects:

1. One root object (All trees have roots.)

2. One or more container objects (Most trees have branches, here they consist of containers.)

3. One or more leaf objects (Most trees have leaves during the summer.)

Unlike a real tree, the NDS tree places its root object at the top of the tree. The root object is a mandatory object and therefore can't be renamed or removed.

Container objects make up the branches of the tree structure and can be compared to directories on a DOS-based file system. Just as a directory in a DOS-based file system contains files that are related in some way, containers hold objects that are related to one another in some fashion. Container objects can hold other objects, such as a leaf object or another container object. (This is similar to the way that a tree branch can hold a leaf or another tree branch.)

Leaf objects are named after real leaves in a real tree. They signal an endpoint of a branch in the tree structure and represent an actual item on the network, such as a particular user or server.

Although the directory tree is a hierarchical structure, it is up to the organization how the structure is defined. In fact, you can think of the hierarchical structure as similar to the hierarchy of personnel in an organization. The old school of thought was to have a deeply layered hierarchy with many mid-level managers. Today, however, you are hearing about many organizations that have chosen to flatten

their personnel reporting structure. You may want to design your directory tree in a similar manner.

# Directory Services Q & A: Time Synchronization



**What is the NetWare Directory Services (NDS) Time Synchronization?**



You can think of time synchronization as similar to synchronizing watches at a group gathering. Humorously, the first thing that comes to mind is what you sometimes see in the movies, right before a bank robbery. The bank robbers always synchronize their watches so that their activities occur precisely at the same moments. Since all of the watches might have different times at the time of synchronization, all watches are set to the time of one watch.

In NetWare 4.x, time synchronization is a new feature important to servers in the network. Timing becomes critical in an internetwork where the NDS database events are replicated and distributed. A server verifies a replication by looking at the time stamp to determine whether it has received the information or not. The server receiving the replica must have its time synchronized with other servers in the internetwork. A server, at installation time, can be designated as a specific type of time server in addition to the other services it provides. A server can be defined as one of the following four types of time servers:

1. Single Reference Time Server (Sole time source for entire network)

2. Reference Time Server (RTS) (time source for Primary Time Servers) This server's time is usually set after checking an outside source such as the Naval Observatory Time.

3. Primary Time Server (PTS) (checks with other PTSes and RTSes and changes time)

4. Secondary Time Server (receives its time from servers 1-3 above.)

NetWare's time synchronization differs a little from the bank robbery synchronization above in that you do not physically set all of the servers to the same time. This is done automatically by the time synchronization servers. Instead, you define what type of time server you are installing and designate a time offset during the installation of a 4.x server.

The time offset is set in relation to the Greenwich Mean Time(GMT) standard. NetWare uses GMT as the baseline for its time operations. A 4.x server is set in relation to how many hours ahead or behind the GMT it is. For example, if you live in New Jersey, you are 5 hours ahead of the GMT, or +5. In the installation,

you would record that your server is plus 5 hours, and also record whether or not New Jersey observes Daylight Savings Time.

Occasionally, servers lose or gain time, and so the process of synchronizing the servers must be an available feature. If there's a Single RTS, all other servers are set to its time. If not, an RTS is used to set the time on PTSes. And, in turn, Primary Time Servers are used in setting Secondary Time Servers.

When events occur in the NDS, the events are time stamped according to GMT. The time stamp helps order the events on the network. For example, if Jim H. changes his password twice in one day, the password changes are considered two events and are time stamped. When the information is replicated, a receiving server looks at the time stamps and determines which event is recorded first. Therefore, it is mandatory that all servers on the internetwork are operating in synch.

# Directory Services Q & A: Partitions and Replicas in NDS

**What are partitions and replicas in a NetWare Directory Services (NDS) tree in NetWare 4.x?**

Partitions are logical divisions of an NDS tree. An NDS tree that contains four branches can be divided into four logical partitions, or one, two, or three logical partitions. Regardless of how the partitioning is created, one partition cannot overlap another, which means that objects can't belong to more than one partition. It is not uncommon to find more than one server in a partition.

Replicas are partitions of an NDS tree that are distributed or copied among one or more servers. They are similar in concept to taking the bindery of one server and copying it to another server for backup purposes. The difference is that you can't have a server with two working binderies, only one.

There are three types of replicas:

1. Master replica--created for each NDS partition; must be used to change information about that specific partition in NDS

2. Read/Write replica--can read or write to the partition; changes are replicated

3. Read-only replica--can only read information from this partition

In NetWare 4.x, a server can contain replicas of more than one partition. For example, an organization might have four servers with four partitions: root, sales, marketing, and HR.

| Server | Partition |
|--------|-----------|
| Marketing | Marketing |
| Sales | Sales |
| HR | HR |
| HQ | Root |

In versions of NetWare prior to 4.x, if a server went down, all users and resources connected to that server also went down. In NetWare 4.x, this is circumvented by replicating partitions. To avoid this, in our example, we would copy each partition to at least one additional server. The HR partition might be copied to the server with the marketing partition and vice versa.

| Server | Master Partition | Replicated Partition |
|---|---|---|
| Marketing | Marketing | HR (RO), Root (RO) |
| Sales | Sales | Marketing (R/W) |
| HR | HR | Sales (R/W), Marketing (R/W) |
| HQ | Root | HR (R/W) |

If the server with the HR partition abnormally ends (ABENDs), then the users and resources connected to that server would gain access to the system through the server containing the Marketing partition and the replica of the HR partition or through the HQ server.

In addition to fault tolerance for NDS, replicas also can decrease traffic and increase authentication speeds in a wide area network (WAN) environment. If the authentication and access rights information is local to the user, the need to send additional traffic on the WAN to obtain the information is eliminated.

When NetWare 4.x is installed, it sets up default partitions and replicas that should be used during the initial setup. NetWare 4.x provides software tools that permit the administrator to repartition or change partition information, as well as replica information. However, it is advisable that you know what you're doing before attempting to change system defaults.

One final note: You should not confuse replication of the NDS with replication of files. They are two different things. You must maintain a separate backup system to ensure protection of the data files in the enterprise.

# Directory Services Procedure List

[Logging in a User Who Resides in an .OU Below Where the Server Is in the Tree](#)

[Steps to Take When Designing an NDS tree](#)

## Directory Services Procedure: Logging in a User Who Resides in an .OU Below Where the Server Is in the Tree

1. At the DOS prompt, type login username.ou_name and press the Enter key (replace username with the actual login ID, replace ou_name with the actual organizational unit name).

2. At the DOS prompt, type CX ou_name and press the Enter key (replace ou_name with the name of the actual organizational unit).

3. At the DOS prompt, type NCSUPDATE and press the Enter key. This will place a name context entry in the NET.CFG file that will allow the user to log in from this workstation in the future using just his or her login name.

## Directory Services Procedure: Steps to Take When Designing an NDS Tree

1. Keep the names of the containers and objects short but descriptive. This will minimize the typing to be done when mapping drives, etc.

2. Keep the tree as shallow as possible: If you have two servers, having a tree seven layers deep will require more administration than a tree that is one or two layers deep.

3. Before implementing the tree, draw it out and see if it makes sense.

4. Look at using a tool such as DS Standard from Preferred Systems to build a model of the proposed NDS tree from actual data residing in your current NetWare bindery.

## Directory Services Utilities

[AuditTrack v2.04 (Free 30-Day Trial) by On Technology Corp.](#)

[DS Standard from Preferred Systems](#)

[NENV10 and NLOGIN by Darwin Collins](#)

# Directory Services Utility: DS Standard from Preferred Systems

Powerful Daily NDS Management with a Safety Net

DS Standard NDS Manager is a Windows-based, off-line NDS management tool. Using DS Standard, network managers make changes to a back-end database, not the "live" network. With its powerful database capabilities, DS Standard reduces the time required to manage NDS, makes migrations as easy as drag-and-drop, and with over 100,000 copies in distribution, DS Standard is the premier NDS management tool available today!

To run DS Standard NDS Manager, copy the directory \PROGRAMS\PSI\DSINST to your hard disk. Then use the File Run option in Windows. Type SETUP.

Your DS Standard NDS Manager license expires on (January 15, 1996). To purchase a copy of DS Standard software, or to renew this license, please contact your PSI representative at (203) 937-3000.

Thank you for your interest in software from Preferred Systems, Inc.!

# Directory Services Utility: NENV10 and NLOGIN by Darwin Collins

This package documents the methods we use to automatically maintain the workstation network drivers, applications, and other workstation files.

It also includes NLOGIN.EXE, a NetWare 4.1 utility, that makes it easier for users to login to a NetWare 4.10 server. NLOGIN.EXE will search the user's 'short' login name in the NetWare Directory Services (NDS) tree and return the full NDS name so that it can be used for Novell's LOGIN.EXE. The purpose of this package is to aid other ntwork administrators in setting standards, batch files, and utilities and to make the maintenance of workstation network drivers and miscellaneous files painless.

For example, whenever, we receive a newer mouse driver, VLMUP*, or Windows 3.1 patches, we can easily distribute these files to all our workstations. (We usually test them for a week or two on one server before we copy them to other servers and sites).

However, for more complicated installations or anything to do with Windows, such as Lotus SmartSuite, Novell's WIN2NCS, CorelDraw, PCAnywhere, SPSS for Windows, or the Oracle client, we use a package called WinInstall 4.0. You can obtain WinInstall 4.0 by contacting us at (301)270-4458 or CompuServe 71371,635.

To install these utilities, copy the D:\PROGRAMS\NVEN10 directory to your hard disk.

Please read the README.TXT file for more information.

## Directory Services Utility: AuditTrack v2.04 (Free 30-Day Trial) by On Technology Corp.

AuditTrack v2.04, a NetWare network auditing product, is a network surveillance system that allows LAN administrators to track and identify all login, file, remote access, and bindery activity occurring anywhere on a NetWare network.

To install this software, copy the directory D:\PROGRAMS\AUDITTR to your hard disk. Then run the SETUP program from the Windows Program Manager File Run command line. If your hard drive is designated as drive C, type C:\AUDITTR\ Setup.exe and choose OK.

++++++++++

# Security

## Security Q & A

[Books on Network Security](#)

[Changing File and Directory Attributes](#)

[Changing Passwords](#)

[Changing the Supervisor's Password](#)

[Default Account Balance/Restrictions and Class C Systems](#)

[Definition of Viruses](#)

[Digital Signatures and Public and Private Keys](#)

[How Can I Perform an Audit of My Network to Make Sure It Is Secure?](#)

[Preventing Viruses](#)

[Restoring Bindery and Trustee Assignments](#)

[What Is Disaster Recovery and Do I Need It on My LAN?](#)

# Security Q & A: Default Account Balance/Restrictions and Class C Systems



**How can I set up my Default Account Balance/Restrictions so that my NetWare installation can be classified as a Class C system?**



You'll need to change some of the defaults in the Default Account Balance/Restrictions and Intruder Detection/Lockout. The following table provides the minimum requirements for Class C classification:

**DEFAULT ACCOUNT BALANCE/RESTRICTIONS**

| | |
|---|---|
| Account Has Expiration Date: | No |
| Date Account Expires: | |
| Limit Concurrent Connections: | Yes |
| Maximum Connections: | 1 |
| Create Home Directory for User: | Yes |
| Require Password: | Yes |
| Minimum Password Length: | 8 |
| Force Periodic Password Changes: | Yes |
| Days Between Forced Changes: | 40 |
| Limit Grace Logins: | Yes |
| Grace Logins Allowed: | 1 |
| Require Unique Passwords: | Yes |
| Account Balance: | 0 |
| Allow Unlimited Credit: | Yes |
| Low Balance Limit: | |
| Limit Server Disk Space: | No |
| Maximum Server Disk Space (KB): | |

**INTRUDER DETECTION/LOCKOUT**

| | |
|---|---|
| Detect Intruders: | Yes |
| Intruder Detection Threshold | |
| Incorrect Login Attempts: | 3 |
| Bad Login Count Retention Time: | 1 Day   0 Hrs   0 Minutes |
| Lock Account After Detection: | Yes |
| Length of Account Lockout: | 7 Days   0 Hrs   0 Minutes |

# Security Q & A: Changing File and Directory Attributes

**How do I change the attributes of a file and a directory?**

In NetWare v3.x these utilities are used to change file and directory attributes:

FLAG            DOS command line utility to change file attributes

FLAGDIR       DOS command line utility to change directory attributes

FILER          Menu driven utility

File and directory attributes override <u>trustee assignments</u> at the user and group levels. However, users must have rights to a file or directory before they can take advantage of the file attributes.

You can modify or assign the following attributes to files in v3.x:

| | | |
|---|---|---|
| A | <u>Archive Needed</u> | used for backups |
| CI | <u>Copy Inhibit</u> | used for Macintosh users |
| DI | <u>Delete Inhibit</u> | file can't be deleted (Macintosh) |
| H | <u>Hidden</u> | file can't be seen with the DOS DIR command |
| P | <u>Purge</u> | a file is automatically purged when deleted |
| RO | <u>Read Only</u> | can view file only |
| RW | <u>Read Write</u> | can view, edit, or rename file |
| R | <u>Rename Inhibit</u> | can't rename file |
| S | <u>Shareable</u> | multiple users can share file |
| SY | <u>System</u> | system files only |

You can modify or assign the following attributes to directories in v3.x:

| | | |
|---|---|---|
| D | <u>Delete Inhibit</u> | directory can't be deleted |
| H | <u>Hidden</u> | directory can't be seen with the DOS DIR command |
| P | <u>Purge</u> | all files in the directory are automatically purged when deleted |
| R | <u>Rename Inhibit</u> | can't rename directory |
| SY | <u>System</u> | defines system directories |

NetWare 4.x uses these utilities to change file and directory attributes:

FLAG    In 4.x, Novell combined several utilities from v3.x, like FLAG and FLAGDIR, into the FLAG command. FLAG is still a DOS command line utility, but now it can be used to modify directory attributes as well as file attributes.

FILER   Menu-driven utility that combines several utilities from v3.x, such as SALVAGE, PURGE, etc., into one utility

In addition to the v3.x file and directory attributes, in 4.x you can modify the following file and/or directory attributes:

| CC | Can't Compress | Based on requirements set by the administrator, this file can't be compressed because it doesn't save enough space. |
|----|----------------|--------------------------------------------------------------------------------------------------------------------|
| CO | Compress | This is a compressed file. |
| DC | Don't Compress | Don't compress this file or directory. |
| DM | Don't Migrate | Don't migrate this file or directory. |
| IC | Immediate Compress | This file or files in this directory are marked for immediate compression. |

# Security Q & A: Restoring Bindery and Trustee Assignments

**Recently, I had to restore the bindery and my trustee assignments were lost. What can I do?**

Trustee assignments are stored with the directory entry and a link to the bindery. When a user is created, the system generates a unique random OBJECT ID number, and a directory is created for each user using that unique OBJECT ID number as the directory name. If you delete a user ID and then recreate the ID, a new OBJECT ID number is randomly generated. The OBJECT ID links the trustee assignments at the directory entry level with the user created in the bindery. Therefore, the bindery and the trustee assignments are two separate items, only connected by a user ID.

When you perform a BINDFIX, it does not back up the trustee assignments. Therefore, performing a BINDREST would not restore the trustee assignments, only the user IDs. It sounds like you backed up your bindery using one of NetWare's utilities like LARCHIVE or NBACKUP. Unfortunately, backing up the bindery using those utilities does not guarantee that the trustee assignments at the directory entry are backed up. You must tell the utility that you want to back up the trustee assignments by choosing to backup the file server but excluding all files.

For example:

    LARCHIVE--Select: INCLUDE all directories, but EXCLUDE all files

    NBACKUP--Select: BACKUP FILE SERVER
        Choose YES to BACKUP TRUSTEES
        Exclude all files by answering "*.*" in FILES TO EXCLUDE

If you have done all of the above, then it sounds like you've restored your bindery to a server with a different name than the one with which you backed up the bindery and trustees assignments. Try changing the new file server's name back to the original name and perform the restore again.

# Security Q & A: Books on Network Security

**Is there a book I can read that will get me started on understanding network security?**

Yes, call (800)262-4729 and order the following book:

Baker, Richard H. *Network Security: How To Plan for It and Achieve It,* McGraw-Hill, New York, NY. $34.95.

This is a good book for every network administrator's library shelf. It guides you through a basic understanding of network security and provides a methodical approach towards preparing, executing, and managing a security plan for a network.

This book prepares you to sell a network security plan to management before an actual breach or problem occurs. Most organizations wait until data is lost before implementing a security or audit plan. Your job is to help management understand that the organization's data is an asset, as are the computers that hold the data.

Although certain aspects of network security don't change, some areas are so new that laws are being decided as the issues arise. For example, recent court cases have held that an employer does have a right to read an employee's e-mail. This book discusses some of the newer issues concerning network security, like privacy.

## Security Q & A: Definition of Viruses

**What is a computer virus and how do virus scanning programs detect them?**

A virus is a program written intentionally to do extensive damage to a computer system, such as erase all its data. Virus detection software can be purchased to look for and eradicate known software viruses. Certain companies such as McAfee and Central Point are famous for providing anti-virus software for workstations and networks. A lot of virus detection software is available for NetWare LANs in the form of Network Loadable Modules (NLMs).

Here's how most virus detection products work: Since viruses are merely computer programs, they can be broken down into simply a string of hexadecimal numbers. Just as each computer program has its own unique hexadecimal code, so does a virus program. Once a virus is found, it can be decompiled (by someone who really knows what they're doing) into hexadecimal code. This information can then be provided to companies that provide anti-virus software programs.

These companies build lookup tables or databases with a record entry for each known virus string. For example, if Company Y's virus software can detect 700 known viruses, their virus lookup table would contain 700 records. Each record contains one virus, broken down into its hexadecimal string. (i.e., Virus A could be represented by the following hex string: 00 28 76 99 7A 32 20 ..., Virus B: 29 20 00 ...., etc.)

As an anti-virus software program is scanning a hard disk (or NetWare volume) for known viruses, it is looking for any of the hexadecimal strings it has in its lookup table. If it finds a string that matches exactly with a string that's in the table, it not only detects a virus, but can even identify which known virus is present. Since it's a known virus, the anti-virus software can often take necessary steps to eradicate the virus.

The only flaw with the above scanning method is that it is based on the premise that only known viruses will enter your PC or workstation. Unfortunately, many talented people use their skills to the detriment of computing, and continue to provide the world with brand new viruses. Because of the ever-increasing supply of viruses, the demand for anti-virus software companies to continually update their known virus lookup tables never stops. Not only are new viruses appearing every day, but new types of viruses, which employ stealth and polymorphic

techniques have arrived.

A stealth virus compresses portions of itself in an attempt to sidestep a virus detection program, and then decompresses itself upon execution. A polymorphic virus mutates its code (string of hexadecimal numbers) upon replication in an attempt to sidestep a virus-detection program.

# Security Q & A: Digital Signatures and Public and Private Keys

**Can you explain, in plain English, what public and private keys and digital signatures mean?**

Network security is most important today because of remote access to the LAN, interconnection with WANs, the Internet, and more. As enterprise networks become truly global, security plays an important role in protecting a company's most recent assets--its data.

Novell licensed the industry's most secure encryption and digital signature technology, from RSA Data Security, Inc. RSA passes Department of Defense and ISO/OSI X.509 security requirements. In addition, Novell has obtained C-2 (Red Book) certification for NetWare 4.10 and certain groups of client machines. NetWare is the only NOS that provides this two-way security between client and server.

Let's take a basic look at a technology called public-key cryptography. In this example, we'll simplify it by using two people--JoAnne and Nancy-- who want to send data to one another. In public-key cryptography, both JoAnne and Nancy have two sets of keys: public and private. Nancy can give JoAnne her public key, but must keep her private key very secure. JoAnne also does the same--she gives Nancy her public key, but keeps her private key very secure.

JoAnne can encrypt a file for Nancy using Nancy's public key, and then transmit the file to Nancy. Nancy can then decrypt the file using her own private key. The idea here is that you can distribute your public key for others to encrypt and send messages to you. Only you, with your highly guarded private key, can decrypt the messages.

When Nancy decrypts a message from JoAnne, there's no way for Nancy to tell that the message was actually sent by JoAnne. In other words, if someone gained access to Nancy's public key they could encrypt a message to Nancy under JoAnne's name. Nancy must have a way to verify that the message is really from JoAnne. Nancy needs a digital signature that authenticates the message as JoAnne's.

Digital authentication requires one more step in the encryption/decryption process. Let's take the same example of JoAnne sending a message to Nancy. JoAnne first uses her private key to encrypt the message (this is a text string that JoAnne and Nancy have agreed upon that essentially says, "Hey Nancy, it's me,

JoAnne."), and then encrypts it again using Nancy's public key.

When Nancy receives the message, she first decrypts it using her private key, then decrypts it again using JoAnne's public key to obtain the text string they agreed upon. Nancy has authenticated that the message was from JoAnne.

So, how does NetWare implement this public-key technology? When a user logs into the system, he or she is assigned a public and a private key. This assignment is done only for that session. For example, if the user logs out, and then logs back in, he or she will receive two new keys. The keys are created by randomly choosing two large prime numbers and then performing some mathematical calculations on them.

NetWare provides the authentication process in the background, transparent to the user. The user is authenticated initially when logging into the system, and then as the user requests specific resources on the network, which may reside other than locally, NetWare looks for a local authentication server and grants the request, if approved. This local authentication can prevent authentication information from traveling across wide-area links, in some cases.

## Security Q & A: Preventing Viruses

**What do I need to do to prevent a virus from invading my LAN?**

Several companies provide the most widely-used anti-virus software NLMs for NetWare LANs. Among them are:

| | |
|---|---|
| Cheyenne | InnocuLAN 3.0 |
| Intel | LANDesk Virus Protect 2.1 |
| McAfee | VirusScan |
| Symantec | Central Point Anti-Virus 2.5 |
| Symantec | Norton AntiVirus for NetWare 1.0 |

You can plan on spending at least $2,000 for one of the better packages.

Scanning for known viruses is one way these virus detection packages operate. However, as more and more viruses are devised, known virus tables must be continually updated to remain current. If a network administrator purchases an NLM or workstation scanning package, and then neglects to download the latest updates to the known virus table from the vendor, new strains of viruses can infect the network.

In addition to scanning, anti-virus NetWare Loadable Modules (NLMs) can be installed to for suspicious activity at the file server level. Suspicious activity might be an EXE file that doesn't write to itself, installs with a certain number of bytes, and then all of a sudden, is twice its size. (Note: Some executable files do write to themselves, which is why the NetWare FLAG command that can mark a file as execute only won't work on some software programs.)

Questions often arise about whether or not it is better to scan the file server at night to avoid file server performance degradation. Most NLMs can continuously scan for viruses with minimal noticeable degradation. We feel it is not noticeable enough to risk introducing a virus during the day. After all, a virus can be introduced at 1:00 p.m., and destroy an entire file server by 3:00 p.m.!

Preventing a virus can seem like an insurmountable task; however, some basic steps can be taken to reduce the risk. The one suggestion we have is that you think of your network as a complete system, workstations to file server. Therefore, the steps you take to reduce the risk or contain a virus invasion should be comprehensive.

Educate users about the dangers (i.e., partial or entire loss of data) and ask them not to tamper with workstation virus scan programs.

Implement a workstation-level virus scan. A scan that is performed continuously at the workstation is the most secure method, and often requires a terminate-and-stay-resident (TSR) program or a device driver. Install an anti-virus NLM at the file server, and configure it to scan continuously for known viruses and perform integrity checks on executable files.

Configure the NLM to take action if it does detect a virus on the LAN. For example, do you want the infected file moved to a secure location on the file server (which preserves the file owner's name), or do you want the NLM to immediately eradicate the infected file? Sometimes it's difficult to trace the point of entry if the file is removed immediately.

If the program permits writing to an audit log or sending alerts to management consoles or other management software, gather as much information as you can about the virus, and make sure you are notified right away, as viruses can spread rapidly on a LAN.

If your network is connected through a router or other link to a WAN, you might want to disable the link temporarily until you can verify that the virus has been eliminated. This stop helps to contain the virus.

If you are connected to a WAN, you should have someone call and advise other network administrators of your situation. If you were not successful at containing the virus, others need to know what's coming their way!

## Security Q & A: Changing the Supervisor's Password

**I recently took over management of a network. I don't have the Supervisor's password. How can I find out what the password is, and are there any programs that let me change the password?**

First, we recommend that at least two people in an organization always know the Supervisor's password, since recovering it can be a tedious task. Second, since there are ways to change a Supervisor's password, we recommend that the server be located in a secure place.

NetWare v2.x, v3.x, and 4.x all vary in the way they handle the Supervisor password. In versions v2.x and v3.x, NetWare stores this information in the bindery. The bindery is a collection of files used to maintain information about users and other devices on a network. NetWare 4.x uses directory services to maintain its passwords. It has a tiered level of administrative passwords: SUPERVISOR and ADMIN.

When you first install NetWare, no Supervisor password exists. The assumption is that the network administrator will assign the Supervisor user a password once everything is up and running. So, the key to regaining a Supervisor password is to fool NetWare into thinking it was just installed and that no bindery exists. It will then create a bindery with no Supervisor password. This fooling is done differently depending on which version you currently have.

### NetWare v2.x

The bindery consists of two files, NET$BIND.SYS and NET$BVAL.SYS, which are stored on the SYS volume. Novell provides a tool on its INSTALL disk, called DISKED, that can read dismounted NetWare volume sectors and change the contents. You won't find information on how to use this tool to recover a Supervisor's password unless you've taken a course sponsored by Novell.

Because DISKED can change the contents of the disk sectors, you should be extremely careful when using this tool. Changing one byte incorrectly could render your file server unreadable!

Essentially, you need to read through the sectors until you find the bindery files. Once located, you need to change the extensions of the bindery files to *.OLD.

```
NET$BIND.SYS --> NET$BIND.OLD
NET$BVAL.SYS--> NET$BVAL.OLD
```

If *.OLD files already exist for the bindery, you'll first need to delete them and then proceed. Once you've renamed the bindery files and saved those changes, you should bring up the file server. Since it will not find any bindery files, it will create a new bindery with no Supervisor password.

Log in as Supervisor and then perform a [BINDREST](). Before logging out, change the Supervisor's password to something you'll remember.

After performing this exercise, you should be aware of how insecure a file server can be if located in an open location!


**NetWare v3.x--If You Have Money**

Novell decided not to provide DISKED in NetWare v3.x after surveying its customer base. The customer base wanted better security than DISKED allowed for. However, other companies like Symantec provide tools similar to DISKED.

NetWare v3.x has three bindery files: NET$OBJ.SYS, NET$PROP.SYS, and NET$VAL.SYS. You can use the same procedure to recover a Supervisor's password as we described in NetWare v2.x above. You would need to purchase a tool that can read and edit NetWare volume sectors.

However, that seems like such a tedious approach. If you have $200 to $300 you can spend, Novell and AccessData Corp. both provide solutions to change Supervisor's passwords easily.

Novell [(800) NETWARE] provides an OS2NT.NLM for $200. You will have to sign a non-disclosure agreement. AccessData Corp. [(800) 489-5199] provides an NTPASS.NLM for $295 and requires you to first register the software on your file server by calling them. These two routes are the easiest and least time-consuming methods.


**NetWare v3.x -- If You Don't Have Any Money**

Prior to Novell's NLM, they recommended a different approach. Novell suggested installing NetWare so that the SYS volume is small in size and only includes the NetWare files and utilities. Its theory was that if you lose the Supervisor's password, you can reinitialize the NetWare volume and wipe out the bindery files. Unfortunately, for a 250-user server, this method could be tedious!

Another approach is to make sure that when you install NetWare, you make two

volumes. One for SYS and another we'll call DATA. The following is suggested for smaller networks where recreating user and printer IDs will not be a burden and no money is available for existing tools.

1. Dismount the volumes.

2. Rename the SYS volume to TEMPSYS and the DATA volume to SYS.

3. Mount the renamed SYS volume.

4. Reload the SYSTEM files from diskette (which will load on the new SYS).

5. Restart the server.

6. Upon booting, NetWare will load on the new SYS volume.

7. Not finding any bindery files, the system will create new ones on the new SYS volume.

8. Log in as Supervisor (there won't be a password since the bindery is new).

9. Run BINDFIX (which will create *.OLD files of the current new bindery).

10. Mount the TEMPSYS volume.

11. Copy the *.OLD bindery files to the SYSTEM directory on the TEMPSYS volume.

12. Run BINDREST.

13. Change the Supervisor's password.

14. Run BINDFIX to delete old mail directories.

The above method only affects the bindery files on the original SYS volume, as compared to Novell's older solution, which is to recreate the SYS volume.

# Security Q & A: Changing Passwords

**At what intervals should users on my network change their passwords? Do you have any simple rules for assigning passwords?**

There are no cut-and-dried formulas for the time intervals between forcing users to change their passwords. Rather, you should construct an overall security plan, educate your users for the reasons, and enforce the plan. You want your plan to be reasonable enough that the users will abide by it, but secure enough that no threats to data integrity occur.

Your plan should incorporate the following with regard to passwords:

1. Force periodic password changes.

2. Do not permit passwords that contain the user's name.

3. Require passwords to be unique.

4. Require passwords to be a minimum length.

5. Do not allow users to exchange passwords.

**Force Periodic Password Changes**
Novell permits you to set as a default the frequency your users will be required to change their passwords. Typically, thirty to forty days is a good minimum to use. If you require users to change their passwords more frequently than that, they may find it necessary to write their passwords down in order to remember them-- that's something you don't want.

**Don't Permit Passwords That Contain the User's Name**
The easiest passwords to figure out are those that contain the user's first name or last name. You can purchase software from companies such as BindView Corp. that can sift through the bindery and present you with a report of insecure passwords (such as PASSWORD). You can then contact those individuals and tell them why their passwords should be changed.

**Require Passwords to Be Unique**

This means that a user is not permitted to use the same password when prompted for a new password. NetWare stores the last eight passwords used by an individual and, with this option turned on, forces the user to use eight different passwords before reusing the original password.

In NetWare v2.x, this is difficult to achieve because the system provides space for eight unique passwords but no minimum time limit. Many users were able to circumvent the password requirement by changing their password eight times in one day to go back to their original password.

In NetWare v3.x, this problem was corrected. The number of unique passwords is still eight; however, the user must wait eight days before he or she can use the same password.

**Require Passwords to Be a Minimum Length**
Many people say a minimum password length of eight is good. However, remember that you don't want to make passwords so long that the users have to write them down to remember. Many first names are three to five characters, so setting the minimum length greater than five will prevent most users from using their first names or initials.

**Do Not Allow Users to Exchange Passwords**
This one is very tough to prevent. Most of your prevention here will be on how well you educate your users as to the potential dangers. You might want to educate them on what can be traced with a login ID. For example, you might show them how a deleted file shows up with the person's login ID that deleted the file. This might show them that someone could use their passwords to create damage to the network and they would be responsible.

# Security Q & A: Disaster Recovery

**What is disaster recovery and do I need it on my LAN?**

Yes, you need to plan for disasters on your network!

Disaster recovery is a plan that details actions that should be taken in the event of a disaster to bring a system back online. The word disaster can take on different meanings in different organizations. For example, in one organization, a server crash might not cause much disturbance because all the applications might be loaded locally on users' local hard drives. However, another organization that maintains high-level information accessible only by that server could lose millions of dollars for each minute the server is down.

Here are some examples of disasters:

Environmental--hurricane, fire, flood, temperature problem, etc.

System failure--disk crash, server ABEND, etc.

Intentional--virus, disgruntled employee, etc.

Physical layer--cabling, connectors, adapters, etc.

Remember, one bad network adapter in a server that stands to lose millions of dollars per each minute a server is down is a disaster.

Some of the above examples of disasters can be prevented by adding fault-tolerance to the network. However, sometimes organizations don't realize the importance of spending an additional $10,000 to prevent a million-dollar disaster until after the problem surfaces. Some examples of fault-tolerance are the following:

Mirroring or duplexing disk drives

Striping drives using RAID

Mirroring servers

Duplicating telecommunication links

Maintaining hot-swappable spares on site

Network management is another way to prevent disasters from occurring. Monitoring devices on the network for certain conditions or thresholds that trigger alerts to a pager can notify an administrator of impending doom. Finding out about a disaster that is about to happen may give an administrator time to rectify the situation before it occurs.

Some disasters are not preventable, but common sense can prevent too much damage from occurring. For example, there's no way to prevent a flood. However, you can minimize damage to network equipment by not putting the computer room in the basement or first floor of a building. Now, if a fire burns the building down, even a computer room on the 18th floor might not escape total damage. However, taking backup tapes to another location at least once a week would ensure that at least the data would be safe (as long as that location isn't next door!). And, there's no point in having a wonderful backup tape off-site if there's no way to restore the tape (remember, your tape drive was burned up in the fire).

In a disaster recovery plan, minor and major details must be well thought out. One way to draw up the plan is to start by categorizing levels of disaster. For example, a hurricane could wipe out an entire city, whereas a fire might only wipe out a building or a floor of a building.

Your plan should include step-by-step details like the following:

1. Who to call first, second, etc. and all phone numbers of the contacts

2. Definitions of critical business areas

3. Alternate sites

4. Spare parts (like servers and tape drives) and who can provide them

5. Telecommunication link restoration

The best way to begin this adventure is to gain support of this project at the top layer of your organization. From there, you can work on designating members for an emergency response team that will assist you in developing the plan, as well as implementing it should the need arise.

Now for the good news: For $995, Prepare 2.0 by Palindrome will generate a disaster recovery plan for your network. It includes configuration information about your network and everything you'll need to get your business back up and running. As your business changes, Prepare 2.0 will generate a new plan.

# Security Q & A: Performing an Audit of Your Network

**How can I perform an audit of my network to make sure it is secure?**

When you say network, we take that to mean everything on your network, from the Physical Layer to the Application Layer. Unfortunately, there is no one product that can do this electronically for you. However, there are many products on the market today that can assist you in this endeavor. Novell also provides several Application Notes on this topic.

Your first step should be to obtain one of the following Novell publications. These publications detail a methodology to conduct a thorough audit on a network, covering every area possible from desktop to network adapter to cabling to servers. By researching this information prior to performing an audit, you can make sure that you don't overlook obvious security loopholes.

*NetWare v3.x Cooperative Research Report* (Novell and Coopers & Lybrand)
   *NetWare Security: Configuring and Auditing a Trusted Environment*.

*NetWare 4.x Application Notes* by Novell
   *Building and Auditing a Trusted Network Environment with NetWare 4,* April 1994
   *An Introduction to Novell's Open Security Architecture,* August 1994
   *Understanding the Role of Identification and Authentication in 4.x,* October 1994

Once you've read through these audit documents, you should begin to familiarize yourself with software that is available today to assist you in some of your auditing efforts. One such software package, by BindView Development, is BindView. It provides desktop auditing as well as server auditing. The desktop audit includes a hardware and software audit that is performed when a user logs into the network. The server audit includes the gathering of information on print servers, print queues, possible security problems, and much more. The information is collected into a Btrieve database; through a C-Worthy interface, it can be used to generate audit reports. Other software runs on top of Hewlett-Packard's Openview platform, including   Novell's ManageWise and Intel's LANDesk products.

In the hardware arena, Compaq is leading the pack with its Insight Manager. This software ships with the server and provides a pictorial view of components of the server, as well as inventory information.

Below are some examples of information that should be audited:

Desktop--software/hardware: application versions, amount of RAM, BIOS type, CPU

Server--security breaches, supervisory activities, amount of RAM, server components

Applications--metering of licenses, who copies software off the network

Cabling--type, category levels, fire code compliance, documentation, runs, cable numbers.

Users--proper rights: file access rights, directory access rights, passwords required

Data--privacy, unauthorized accesses, protocol analysis, regular backups, encryption

Written policies--e-mail, sensitive data, access to data

Voice systems--password requirements for voice mail. PBX password requirements

Dial-up to network--passwords requirements

WAN links--security, encryption

## Security Procedure List

[Identifying Problems in NetWare Security on a v3.x Server](#)

[Steps to Take for a More Secure Server](#)

## Security Procedure: Identifying Problems in NetWare Security on a NetWare v3.x Server

1. Log into the server as Supervisor or Supervisor equivalent.

2. Change to the SYSTEM directory.

3. Type SECURITY > REPORT.TXT and press the Enter key.

4. When the DOS prompt returns to the screen, you can use a DOS text editor to view the file (REPORT.TXT) and look for login IDs that don't have a password, haven't been used for a long time, etc.

## Security Procedure: Steps to Take for a More Secure Server

1. At the server console prompt, type REMOVE DOS and press the Enter key: This will prevent the loading of NLMs, .DSKs, or .LAN files from the disk drive or DOS boot partition of the hard drive.

2. At the server console prompt, type SECURE CONSOLE and press the Enter key: This will prevent the loading of any module (.DSK, .LAN, or .NLM) from other than SYS:\SYSTEM. It will also cause problems for those modules loading that require support files residing in other directories.

3. Place the server in a secured room where only a few individuals have access to it.

4. Keep the number of individuals who have Supervisor-equivalent access to a minimum.

## Security Utilities

AuditTrack v2.04 (Free 30-Day Trial) by On Technology

John T. McCann's SofTrack (Free 30-day Trial) by On Technology

VirusScan for Windows 95 from McAfee

VirusScan from McAfee

## Security Utility: VirusScan for Windows 95 from McAfee



VirusScan for Windows 95, a native 32-bit anti-virus solution, exploits the new capabilities of Windows 95.

To install this software, copy the directory D:\PROGRAMS\MCAFEE\S95 to your hard disk. Then run 100E.EXE from the Windows Program Manager File Run option. If your hard drive is designated as drive C, type C:\S95\100E.exe and choose OK.

## Security Utility: VirusScan from McAfee



VirusScan is an anti-virus package from McAfee for NetWare LANs.

To install this software, copy the directory D:\PROGRAMS\MCAFEE\WSC to your hard disk. Then run the SETUP program from the Windows Program Manager File Run command line. If your hard drive is designated as drive C, type C:\WSC\ setup.exe and choose OK.

## Security Utility: AuditWare from Preferred Systems



Automated Reporting Tools for the Enterprise

AuditWare is a Windows-based reporting tool for Novell NetWare. It is the first available tool that provides true multi-server support. And since configurations are captured to a database, it alleviates network degradation caused by most other reporting tools. A Windows-based custom report writer enable exception reporting, and AuditWare's extensible architecture allows external databases to be linked into any report.

Your AuditWare license expires on (January 15, 1996). To purchase a copy of AuditWare software, or to renew this license, please contact your PSI representative at (203) 937-3000.

Thank you for your interest in software from Preferred Systems, Inc.!

To install AuditWare, copy the directory \PROGRAMS\PSI\AUDIT to your hard disk, and choose the File Run option in Windows. Type in SETUP.

## Security Utility: AuditTrack v2.04 (Free 30-Day Trial) by On Technology



AuditTrack v2.04, a NetWare network auditing product, is a network surveillance system that allows LAN administrators to track and identify all login, file, remote access, and bindery activity occurring anywhere on a NetWare network.

To install this software, copy the directory D:\PROGRAMS\AUDITTR to your hard disk. Then run the SETUP program from the Windows Program Manager File Run command line. If your hard drive is designated as drive C, type C:\AUDITTR\ Setup.exe and choose OK.

## Security Utility: John T. McCann's SofTrack (Free 30-Day Trial) by On Technology



SofTrack, a software metering package, includes native support for Novell's NetWare Directory Services (NDS).

To install this software, copy the directory D:\PROGRAMS\SOFTRACK to your hard disk. Then run the INSTALL program from the Windows Program Manager File Run command line. If your hard drive is designated as drive C, type C:\softrack\install.exe and choose OK.

## Security Demos

[Ontrack Volume Repair Detector Slideshow from Ontrack Data Recovery](#)

## Security Demo: Ontrack Volume Repair Detector Slideshow from Ontrack Data Recovery

The Ontrack Volume Repair Detector package is designed to inform NetWare supervisors and system administrators about safe methods for recovering from NetWare volume corruptions. The package contains two sections: a Novell NLM that detects the loading of VREPAIR and a slideshow presentation that educates users on data security. The NLM warns supervisors to make certain that backups are adequate before attempting any repairs that could permanently damage critical files. The slideshow provides screen shots from the Ontrack Data Recovery for NetWare data recovery and protection utility.

To view the slideshow, run D:\PROGRAMS\ONTRACK\SLIDESHW.EXE from the File Run option of the Windows Program Manager.

## Cabling

**CD HELPdesk Series: Novell Products**

Click on any icon for more information

Q+A    PROCEDURE LIST    VENDOR LIST

## Cabling Q & A

[10BASE-T Media](#)

[10BASE-T Stranded or Solid Media](#)

[Cabling between Buildings](#)

[PVC-Coated vs. Plenum Media](#)

[RJ-45 Connector Differences](#)

## Cabling Q & A: 10BASE-T Media



**We are getting ready to install the wiring for our 10BASE-T network. The cable installer says we can save money by using Category 4 cabling instead of Category 5. What does this mean to us?**



Category 5 cabling is more expensive than Category 4 cabling but more tolerant to noise. Using Category 5 is a must if you are even thinking of upgrading your network to 100 megabit per second (Mbps) Ethernet at some point in the future.

Although some of the specifications for 100BASE-T indicate that you can run it on Category 4 media, you have less of a safety net than with Category 5 cabling. Make sure the installer pulls four-pair wiring, uses 110-type punch-down connections, and punches down the connections in the same manner throughout your network. This will help reduce problems down the road, once you start using the cabling.

## Cabling Q & A: 10BASE-T Stranded or Solid Media

**Our cabling installer asked us if we want to use stranded or solid cabling for our 10BASE-T network. Which is the best type of cabling to use?**

You may want to use a combination of wiring. You will probably want to use a patch cable made of stranded wire for the run between the workstation and the wall outlet for the network. Since PCs get moved around from time to time, this will help reduce the possibility of a broken wire in the cable causing a problem. For the cable run from the wall outlet to the hub or wiring blocks, solid-core wiring will work best.

## Cabling Q & A: RJ-45 Connector Differences

**We were purchasing additional RJ-45 connectors for our network and the counter person at the parts house asked us which kind we wanted. Aren't RJ-45 connectors all alike?**

Unfortunately, there are several different kinds of RJ-45 connectors from several manufacturers. There are two major types of RJ-45 connectors: one for solid core cable, the other for stranded. The variations start to come into play depending on the kind of crimping tool you have. For example, there are connectors made specifically for the AMP crimping tool, although some other connectors will fit. One of indication that you have the wrong connector for your crimping tool is that the tool has a tendency to crush the part of the RJ-45 connector intended to serve as a strain relief for the cable.

# Cabling Q & A: PVC-Coated vs. Plenum Media

**Our local fire code says that in certain parts of the building we have to use plenum-type cable instead of plastic or PVC-coated cabling. What is the difference between the two?**

Plenum cable is more resistant to burning when in a fire. When it does burn, it doesn't give off the poisonous gases other kinds of cabling do. Plenum is somewhat more rigid than other types of cable. It can be harder to pull around tight corners than its non-plenum counterparts.

## Cabling Q & A: Cabling between Buildings

**We will be connecting networks in two buildings. Although the buildings are close enough for a coaxial cable run, should we look at using fiber-optic cable instead?**

Fiber-optic cable will be considerably more expensive to run, but has several qualities that make the cost worthwhile. Determine if the buildings are running from the same power transformer or feed. If they are being fed from different sources, then you are a prime candidate for fiber-optic cable, which will electrically isolate the two buildings from each other. This will prove helpful if there is a ground potential difference between the two locations.

Using fiber-optic cable will also allow you to move to higher network speeds as technology progresses. You may not have the same degree of flexibility with copper-based cables, such as coax.

# Cabling Procedure List

[Building a 10BASE-T Crossover Cable](#)

[Explanation of the 5-4-3-2 Rule for Coax Networks](#)

## Cabling Procedure: Building a 10BASE-T Crossover Cable

1. A crossover cable requires two RJ-45 connectors, a length of cable less than 20 feet long, and an RJ-45 crimping tool.

2. Connect pin 1 on connector A to pin 3 on connector B.

3. Connect pin 2 on connector A to pin 6 on connector B.

5. Connect pin 3 on connector A to pin 1 on connector B.

5. Connect pin 6 on connector A to pin 2 on connector B.

6. Crimp both RJ-45 connectors using the crimping tool.

7. This cable will allow for the direct attachment of a workstation to a network adapter in the file server without using a 10BASE-T hub.

## Cabling Procedure: Explanation of the 5-4-3-2 Rule for Coax Networks

1. A coax Ethernet network can consist of no more than five segments connected via a repeater between segments.

2. There can be at most four repeaters used on the entire cable run.

3. Only three segments can be populated (i.e., have workstations on them) and should they be limited to approximately 30 devices per segment.

4. Two segments must have no devices present.

## Cabling Requirements

**Cabling requirements:**

**10BASE-2 (Thin Ethernet)**

- Solid center conductor RG-58 gauge cable

- 50-ohm terminator at each end of the cable run

- Five segments total in length, two of which have to be unpopulated

- Maximum cable length is 607 feet without using repeaters

- Cable needs to be grounded to a good electrical ground at one end of each segment

**10BASE-T**

- Category 3 cable minimum; Category 5 best

- Use solid-core cable for long runs between hub and wall outlets; use stranded cable for patch cables and those cables connecting PCs to wall outlets

- Can go through four hubs maximum between workstation and file server

- Shouldn't exceed 300 feet between workstation and hub

+++++++++

## Backup

**CD HELPdesk Series: Novell Products**

Click on any icon for more information

Q+A

PROCEDURE LIST

VENDOR LIST

## Backup Q & A

[Cleaning Backup Drives](#)

[Definition of Disk Duplexing](#)

[Definition of Disk Mirroring](#)

[Definition of Hot-Swappable](#)

[Definition of RAID](#)

[Differential vs. Incremental Backups](#)

[Digital Audio Tape (DAT) Differences](#)

[Protection from Power Problems](#)

[Tape Storage and Disaster Recovery](#)

## Backup Q & A: Protection from Power Problems

**How can I protect my servers from power problems?**

In developing Disaster Recovery Plans or a security plan, protection against power-related problems is one of the most overlooked areas. If you plan to locate your file server in a building where frequent power hits*,* surges, or fluctuations occur, you could be setting yourself up for disaster if you don't plan for an alternate source of power. After all, if power to the server is gone, you could end up with a server crash that results in damage, corruption, or loss of files.

In larger organizations, it is not uncommon to find a computer room with raised floors, air conditioning units separate from the rest of the building, temperature sensor alerts, and entire Uninterruptible Power Supply (UPS) systems tied to the building generator. In smaller organizations, standalone UPSes can be found tied directly to the file server. In many organizations, the power supply to the building is conditioned to provide an optimal power source to the network.

Regardless of which route an organization chooses, file servers should be connected to a UPS in some fashion. In the larger organizations, tying the circuits of the computer room to a large standalone UPS system that is backed up by the building generator helps to ensure that the whole room (and all of its components) stays up during an unplanned outage. Workstations should be placed on surge protectors.

Liebert Systems and AP Care are probably the leading vendors supplying this type of service. If you have a computer room and a lot of equipment, you'll probably want to make sure the whole room is backed up. Before buying a large UPS unit, ask your building maintenance person how long the building generator can sustain your computer room. The building generator should last long enough to sustain the entire computer room until you can come in and properly shut down the network.

If your organization does not have a very large budget, you can purchase smaller standalone UPS systems that operate using battery backup. These units typically last anywhere from 15 minutes to several hours, depending on the load. When tied directly to the file server using a cable, and with the UPS.NLM loaded on the server, the UPS can detect when there's a power loss and send an alert to the file server. The file server sends out a broadcast to all the users that says the server is going down in X minutes, save your work and log out.

As a side note: If you have intelligent hubs distributed throughout the building in wiring closets, don't overlook the fact that they should also be connected to a UPS in some way. Power glitches in a building can cause damage to adapters in an intelligent hub or to the whole hub itself. A downed adapter or hub can result in groups of people unable to work.

If you'd like more information on this topic, you can obtain a copy of a report published by Novell Research in 1991, "Power and Grounding for Distributed Computing," by David Fencl and Larry Fish of ONEAC Corp.

# Backup Q & A: Definition of Disk Mirroring

**What is disk mirroring?**

Disk mirroring is the process of writing data in duplicate to two or more sets of disks. One drive is labeled as the primary drive, and the other as the secondary drive. Every write intended for the primary drive is also written to the secondary drive. Disk mirroring is used in environments where hard disk downtime is not acceptable. Therefore, by having two drives containing identical data, if one should fail, the users automatically pull their data from the secondary drive.

Disk mirroring is provided by NetWare out of the box; however, in order to use it, you must activate it from the INSTALL program. In addition, before you activate it, you must have a secondary drive of equal size to mirror the first drive to the second drive.

If you plan to use external SCSI drives, you may notice a slight performance increase in read activity, since the drives are smart enough to know they can get the information from two places.

You should monitor the status of the mirrored drives via the INSTALL.NLM or the server error log to make sure that they remain mirrored. After all, the purpose of mirroring the drives is to prevent downtime. If one drive fails and it goes unnoticed, you'll be operating off only one drive, and then you're back to where you started from.

And finally, in no way should you eliminate the task of backing up your file server and its data just because you are mirroring the drives. You should still perform backups and take the tapes off-site, in the event that both sets of drives should fail or become damaged in a fire or other disaster.

# Backup Q & A: Definition of Disk Duplexing

**What is disk duplexing?**

Disk duplexing takes the process of disk mirroring and adds one more level of fault tolerance--duplicating the disk controller. In disk mirroring, only the drives are mirrored, not the drive controllers. Therefore, in disk mirroring, the premise is that one of the hard disk drives will fail, not the controller that connects the drive. However, the flaw in that premise is that disk controllers do fail, and if it does, your whole server is ruined.

Disk duplexing takes the risk out of that premise, and adds another controller. The concept of mirroring still applies; however, now the data will travel through two completely separate channels.

If the primary disk channel fails, the secondary channel takes over operations. Installation of duplexing is the same as with disk mirroring; in fact, the screens on the file server INSTALL console are the same. The only difference is that since there are two controllers, two drivers need to be loaded, or one loaded twice, with different base I/O addresses.

One thing we should point out: At no point should you think that because the drives are duplexed, you can eliminate the step of backing up the file server's data and taking the tapes offsite. This still must be done--you'd really be in a pickle if both sets of drives were to fail. Although such instances are rare, fires do occur.

Although duplexing provides more security than mirroring, it too is based on a premise that the only parts that might fail are the controllers or the drives. What happens if another part in the server fails? You'll have to look for server mirroring to answer that question!

And finally, don't forget to factor the extra disk controller cost into your budget!

## Backup Q & A: Definition of RAID

**What is RAID?**

RAID stands for redundant array of inexpensive (or independent) disks and is one method used to span data across two or more disk drives so that the drives appear as one drive and data can be recovered even if one of the drives fails.

The data is spanned across two or more drives in a technique called striping. Striping data across the drives can occur at the bit level, byte level, or block level, depending on the level of RAID you are using. In some levels of RAID, data redundancy is built in by including a parity drive. For example, if you have four drives, three of the drives are used for striping data, and on the fourth drive a computation is performed to obtain parity information about the other three drives.

Let's look at that a little closer using four 100 megabyte (MB) drives as an example, in which 0=even parity and 1=odd parity for the parity drive:

| DRIVE 1 | DRIVE 2 | DRIVE 3 | DRIVE 4 |
|---------|---------|---------|-------------|
| data | data | data | parity info |
| 1 | 1 | 1 | 1 |

Here we have four drives striped at the bit level. That means when a file needs to be stored, the bits of the file are striped across drives 1 through 3. Drive 4 looks at the value of the bits, whether it is a 1 or a 0, and adds the bits together. If the addition comes up odd, a 1 is placed in Drive 4; if the addition comes up even, a 0 is placed in Drive 4. If Drive 2 fails, all the information is available to the system to reconstruct the failed drive from Drives 1 and 3, plus the parity drive.

This type of striping was first implemented on Compaq SYSTEMPRO found on LANs and was called Data Guarding. In the above example, you would lose 25 percent of your storage space, as opposed to 50 percent in mirroring and duplexing. This is only one of the levels of RAID. The following is a list of the different RAID levels:

- RAID Level 0--Data is striped over all of the drives: There is no parity drive.

- RAID Level 1--Data is striped over drives: Drives are mirrored instead of using a parity drive.

- RAID Level 2--Data is striped over all of the drives at the bit level.

- RAID Level 3--Data is striped over all of the drives at the bit/byte level: Parity drive is used.

- RAID Level 4--Data is striped over all of the drives at the block level.

- RAID Level 5--Data is striped over all of the drives at the block level: A parity drive is not used, but parity information is spread across all the drives.

Use of RAID becomes most effective when you're using SCSI-controlled drives. SCSI technology is intelligent enough to take advantage of the data striped across the drives. A SCSI device can issue a read request, and then disconnect itself from the channel to fetch the next request while the prior request is processing. The difference in performance is that the SCSI controller can fetch the information from four drives simultaneously while fetching another request. Other controller technology is designed to fetch information one request at a time. In addition, the older technology typically requires that each request be completed before the next request begins processing.

## Backup Q & A: Definition of Hot-Swappable

**What does the term hot-swappable mean?**

Hot-swappable is a term used for components of a system that can be swapped out while the system is up and running.

The term is fairly new to the LAN arena because, until recently, LANs weren't always recognized for their critical nature. However, as more downsizing and rightsizing efforts are underway, more mission-critical data is being placed on LANs. For some organizations, this means that the components of the LAN must be up and running seven days a week, 24 hours a day.

Likewise, if a component fails, such as a disk drive, you must be able to replace the drive without taking down the server.

Above, we intentionally mentioned components of a LAN, not just the file server, because more components need replacing in a shop that runs around the clock. For example, organizations that have intelligent hubs and routers need a way to replace a single adapter without taking down the entire hub or router. Since one hub can represent 100 users or more, taking the whole hub down just to replace one adapter that might only represent 20 users is not prudent anymore.

Having access to spare hot-swappable parts means that components of a LAN can be maintained with little or no downtime for the users.

# Backup Q & A: Differential vs. Incremental Backups

**We are creating backup jobs for the server and are confused about the terminology. What is the difference between a differential and an incremental backup?**

An incremental backup backs up all files that were created or changed since the last full backup procedure. It resets the <u>archive bit attribute</u> on the file, indicating that it was backed up. A differential backup does the same thing as the incremental, except that it doesn't reset the archive bit attribute on the files. In a restore using an incremental/full backup, you would first restore the full backup and then the incremental backups in the order in which they were performed. With a differential backup, you would restore the full backup and then the last differential backup tape.

## Backup Q & A: Digital Audio Tape (DAT) Differences

**I normally use a 90m 4 mm tape in my digital audio tape (DAT) backup drive. I need to purchase additional tapes but I can only find 60-meter tapes. What is the difference between the two?**

The main difference between the tapes is the length and the amount of data you will be able to back up. Using an HP 35470 2 gigabyte (GB) backup drive, a 60-meter tape would back up a little over 1 gigabit (Gb) of data, whereas a 90-meter tape would backup approximately 2Gb of data.

# Backup Q&A: Cleaning Backup Drives

**I have heard several different arguments on how often I should clean my backup drive. What is the recommended interval?**

Consult the tape drive manufacturer's manual for the recommended maximum/minimum intervals for cleaning the tape drive. Some companies recommend you clean the drive every 8 to 10 hours of use; others recommend a different interval. The exact interval for you will depend on several factors, such as how dirty your operational environment is, how often you use the drive for backups (i.e., daily, weekly, etc.), and the quality of the tapes you use (inexpensive tapes can leave higher amounts of residue on the heads than higher quality tapes, such as 3M or TDK).

# Backup Q&A: Tape Storage and Disaster Recovery

**We make several copies of a backup as part of our disaster recovery plan. How and where should we store these tapes?**

At least one of the copies should be stored off-site in a data-safe area. The location of tape storage should be secure (i.e., an on-duty guard checks tapes in and out, the employee of the off-site storage company gets the tapes for you, or a restricted list of individuals from your company exists that can request tapes from storage). When storing tapes on-site, you need to keep them in the correct type of container. Storing them in a document-safe container won't help you, because paper has a higher burning point than magnetic media. Be sure the storage container is data-media rated.

# Backup Procedure List

[Items to Consider When Selecting a Tape Backup System](#)

[Steps to Consider When Configuring a Tape Backup System](#)

## Backup Procedure: Items to Consider When Selecting a Tape Backup System

1. Choose a tape drive with a capacity that can back up your current server on one tape, while allowing for additional hard drive space to be added without having to use a second tape for backup or replacing the tape drive with one that has a larger storage capacity.

2. Consider using an external tape drive rather than an internal drive. If the drive fails or needs to be moved to another server temporarily, an external drive will be much easier to handle.

3. Consider placing the tape drive on its own controller instead of one that has devices on it. This will make keeping track of SCSI IDs easier when mirroring or duplexing drives.

4. A server-based backup will perform faster as a general rule than a workstation-based backup, since the data won't have to cross the network cable to reach the backup device.

5. Look at the RAM requirements for the backup software. For the best operation of the backup software, you will need to have the cache buffers at 70 percent or higher when the backup software is running.

## Backup Procedure: Steps to Consider When Configuring a Tape Backup System

1. To minimize the time a backup takes each night, select the best combination of full, incremental, and differential backups.

2. Set the start time of the backup so that it will complete before midnight or start after midnight. Some NLMs have log or index files that are reinitialized at midnight and could present a problem during a compare pass if the backup wasn't completed by midnight.

3. Always perform a compare pass as part of the nightly backup process. This helps identify problems with a particular backup tape or drive before they become critical.

4. When storing backup tapes on-site, store them in a data-safe rated container. Conventional fireproof safes may only be rated for document storage, which has a higher burning temperature than tapes.

## Backup Requirements

**Server-based backup:**

- SCSI interface tape drive (internal or external)

- Backup software that runs on the server

- For best performance, a separate SCSI controller for the tape drive

- Server-based backup software will probably require additional RAM to be installed.

**Workstation-based backup:**

- Tape drive doesn't have to have a SCSI interface.

- Tape backup software will need to support the version of NetWare you are backing up to access the security and trustee directory rights configuration on the server.

- The backup software may require additional memory in the workstation for caching operations.

- Backup will take longer, since the data has to cross the network to reach the tape drive.

- The workstation performing the backup will have to remain logged in as Supervisor or Supervisor equivalent (this presents a possible security problem).

## Backup Demos

[Ontrack Volume Repair Detector Slideshow](#)

## Backup Demo: Ontrack Volume Repair Detector Slideshow

The Ontrack Volume Repair Detector package is designed to inform NetWare supervisors and system administrators about safe methods for recovering from NetWare volume corruptions. The package contains two sections, a Novell NLM that detects the loading of VREPAIR, and a slideshow presentation which educates users on data security. The NLM warns supervisors to make certain that backups are adequate before attempting any repairs that could permanently damage critical files. The slideshow provides screen shots from the Ontrack Data Recovery for NetWare data recovery and protection utility.

To view the slideshow, run D:\PROGRAMS\ONTRACK\SLIDESHW.EXE from the File Run option of the Windows Program Manager.

++++++++++

# Server Management

## Server Management Q & A

[Determining the Number of Files a User Has Open](#)

[Dirty Cache Buffers](#)

[Downing and Restarting the Server Automatically from RCONSOLE](#)

[Editing the System Login Script in NetWare 4.10](#)

[Enqueued Sends Count](#)

[External Processor Cache and Performance](#)

[Keeping the Server Secure](#)

[Protecting ADMIN](#)

## Server Management Q & A: Protecting ADMIN

**In a NetWare 4.x environment, how can I protect the user ADMIN?**

Change the user ADMIN password frequently, making sure that the password is ambiguous and is not a word in the dictionary or that it conforms to one of the common password-assigning conventions, such as the user's name, pet's name, etc. Use special characters in the password, such as forward or backward slashes, hyphens, or asterisk. Make sure Intruder Lockout is enabled on user ADMIN. Instead of using user ADMIN directly, create other accounts with administrative access rights and use them when possible. Monitor the system with USERLIST frequently for the login ID ADMIN. Check the server log for ADMIN access especially at unusual times. If possible, create a separate context and place user ADMIN in that context. While this action is not a foolproof method, it has been successful in colleges and universities. It however, may not be an option in large corporate structures and will make operations more difficult for administrative users.

## Server Management Q & A: Keeping the Server Secure

**How can I keep someone from crashing my server?**

Change the Supervisor password regularly. Never write passwords on paper. Make passwords ambiguous. Increase the Intruder Lockout times and decrease the number of attempts allowed (in SYSCON). Delete the GUEST ID. Lock the file server console. Keep the server in a locked room if possible.

## Server Management Q & A: Downing and Restarting the Server Automatically from RCONSOLE

**I occasionally need to make changes to a remote server that requires it to be downed and restarted. Is there a way I can do this without having to have someone at the keyboard?**

For a NetWare v3.x server, create a text file called REBOOT.NCF and place it in the system directory. Place the following lines in it:

    REMOVE DOS
    DOWN
    EXIT

When you type REBOOT at the file server console, it will down the server and reboot it. For a NetWare 4.x server, you only need two lines:

    DOWN
    RESTART SERVER

## Server Management Q & A: Determining the Number of Files a User Has Open

**How can I tell the files a user has open?**

Load MONITOR.NLM at the file server console. Select Connection Information and press the Enter key. Select the user you want to see files for and press the Enter key.

## Server Management Q & A: Dirty Cache Buffers

**I have noticed lately that the dirty cache buffers number in MONITOR.NLM doesn't drop to zero except on rare occasions. Is this something I should be concerned about?**

This figure represents disk cache buffers that contained changed information that haven't been written to disk yet. The first thing you need to do is find the normal figure. This is referred to as a baseline. During heavy periods of disk access, this number can get quite high. If it approaches 90 percent of your total cache buffers figure, this could indicate that your hard disk controller may be the bottleneck in your system performance. Something as simple as downloading and updating drivers or adding additional system memory could resolve the problem.

## Server Management Q & A: External Processor Cache and Performance

**My server has a 128KB external processor cache. I have been told I can improve the performance of my server by increasing the size of the cache. Is this true?**

Increasing the size of the processor cache could help or hurt performance. This primarily depends on the type of cache present. If the cache is a Look Aside cache, a larger cache could impede performance since the processor has to use the same bus to look at the cache as it does to access main memory. During heavy use periods, Look Aside cache, can slow things down. If the motherboard implements a Look Through cache, this isolates the CPU from main memory and allows the CPU faster turnaround if the information needed resides in the cache. The larger the cache is doesn't mean its better for your system. Unless your server has extremely fast SRAM used for cache, you probably won't see much benefit by exceeding an external processor cache of 256KB.

## Server Management Q & A: Enqueued Sends Count

**Looking at the LAN Statistics in MONITOR.NLM, I noticed an item labeled Enqueued Sends Count. I have noticed that this number increases only during times of heavy usage. Is this something to worry about?**

This LAN statistic increments during periods of time when the network adapter has more work to do than it can handle. Increases in the value of this statistic can also be caused by using a 16-bit network adapter in an EISA motherboard, an older LAN driver or a network adapter starting to go bad. Some incrementation will be normal. Defining what is normal or a baseline for your server will go a long way in helping you decide when this or other statistics warrant closer inspection.

## Server Management Q & A: Editing the System Login Script in NetWare 4.10

**I recently upgraded my network to NetWare 4.10. How do I edit the system login script?**

First, NetWare 4.10 differs from NetWare v3.x and v2.x because it can contain more than one system login script. System login scripts in 4.10 can reside at the Organization Unit (OU) or Organizational layers of the NDS tree. System login scripts only execute for those users directly below the O or OU that contains the system login script.

System login scripts are properties of the O object and the OU object. Before you can edit a system login script, you must have the Write property right for the object. There are two utilities you can use to edit the system login script. NETADMIN is the DOS utility, and the NetWare Administrator icon is installed for Windows and OS/2 users. We'll look at both, since you don't mention what environment you're operating under.

**Windows 3.1 or OS/2 2.x**
1. Click on the NetWare Administrator icon
2. Choose the O or OU object for which you want to create or edit a system login script.
3. Choose Details from the Object menu.
4. Choose Login Script.
5. Make the necessary changes to the script and save the changes.


**DOS**
1. From the DOS prompt, type NETADMIN.
2. Choose Manage Objects from the NetAdmin Options menu.
3. Select the O or OU object for which you want to create or edit a system login script.
4. Choose View or Edit Properties of this Object.
5. Choose Login Script.
6. If no script exists, you'll be asked if you want to copy another script into this one. Answer yes or no.
7. Make the necessary changes to the script and save the changes.

## Server Management Procedure List

[Identify Modules That Are Consuming Too Much CPU Time](#)

[Using CONLOG to Capture Information on Currently Loaded Modules](#)

## Server Management Procedure: Using CONLOG to Capture Information on Currently Loaded Modules

1. At the server console prompt, type LOAD CONLOG and press the Enter key.

2. At the server console prompt, type MODULES and press the Enter key.

3. Keep pressing the Enter key when prompted until the server console prompt returns.

4. At the console prompt, type UNLOAD CONLOG and press the Enter key.

5. The resulting text file CONSOLE.LOG can be found in SYS:\ETC with information as to the name, version, etc. of all modules currently loaded on the server.

## Server Management Procedure: Identify Modules That Are Consuming Too Much CPU Time

1. At the server console prompt, type LOAD MONITOR -P and press the Enter key.

2. Select Processor Utilization and press the Enter key.

3. Press F3 and press the Enter key.

4. By using the Page Up, Page Down, up arrow, or down arrow keys, you will be able to see if a module is consuming too much CPU time.

5. After you are done, unload MONITOR and reload it without the -P parameter.

## Server Management Network Utilities

[AuditTrack v2.04 (Free 30-Day Trial) from On Technology](#)

[AuditWare from Preferred Systems](#)

[DS Standard from Preferred Systems](#)

[John T. McCann's SofTrack (Free 30-day Trial) from On Technology](#)

[NetTune PRO from HawkNet](#)

## Server Management Utility: DS Standard from Preferred Systems

Powerful Daily NDS Management with a Safety Net

DS Standard NDS Manager is a Windows-based, off-line NDS management tool. Using DS Standard, network managers make changes to a back-end database, not the "live" network. With its powerful database capabilities, DS Standard reduces the time required to manage NDS, makes migrations as easy as drag-and-drop, and with over 100,000 copies in distribution, DS Standard is the premier NDS management tool available today!

To run DS Standard NDS Manager, copy the directory \PROGRAMS\PSI\DSINST to your hard disk. Then use the File Run option in Windows. Type SETUP.

Your DS Standard NDS Manager license expires on (January 15, 1996). To purchase a copy of DS Standard software, or to renew this license, please contact your PSI representative at (203) 937-3000.

Thank you for your interest in software from Preferred Systems, Inc.!

## Server Management Utility: AuditWare from Preferred Systems

Automated Reporting Tools for the Enterprise

AuditWare is a Windows-based reporting tool for Novell NetWare. It is the first available tool that provides true multi-server support. And since configurations are captured to a database, it alleviates network degradation caused by most other reporting tools. A Windows-based custom report writer enable exception reporting, and AuditWare's extensible architecture allows external databases to be linked into any report.

Your AuditWare license expires on (January 15, 1996). To purchase a copy of AuditWare software, or to renew this license, please contact your PSI representative at (203) 937-3000.

Thank you for your interest in software from Preferred Systems, Inc.!

To install AuditWare, copy the directory \PROGRAMS\PSI\AUDIT to your hard disk, and choose the File Run option in Windows. Type in SETUP.

## Server Management Utility: AuditTrack v2.04 From On Technology (Free 30-Day Trial)

AuditTrack v2, a NetWare network auditing product, is a network surveillance system that allows LAN administrators to track and identify all login, file, remote access and bindery activity occurring anywhere on a NetWare network.

To install this software, copy the directory D:\PROGRAMS\AUDITTR to your hard disk. Then run the SETUP program from the Windows Program Manager File Run command line. If your hard drive is designated as drive C, type C:\AUDITTR\ setup.exe and choose OK.

## Server Management Utility: John T. McCann's SofTrack from On Technology (Free 30-day Trial)

SofTrack, a software metering package, includes native support for Novell's NetWare Directory Services (NDS).

To install this software, copy the directory D:\PROGRAMS\SOFTRACK to your hard disk. Then run the INSTALL program from the Windows Program Manager File Run command line. If your hard drive is designated as drive C, type C:\ softrack\install.exe and choose OK.

## Server Management Utility: NetTune PRO from HawkNet



NetTune PRO is performance tuning and monitoring software for NetWare 4.1.

You can receive an evaluation of this product from HawkNet's World Wide Web site at http://www.hawknet.com/~netinfo.

++++++++++

# Workstation Connectivity

## CD HELPdesk Series: Novell Products

Click on any icon for more information

## Workstation Connectivity Q & A

# Workstation Connectivity Q & A: Large File Transfer Problems

**I am having problems with large file transfers of 5MB or larger on a laptop computer. I have run diagnostics on the laptop and the PC card. No problems were reported. The Card and Socket Services drivers are the latest release. The NetWare drivers are the latest version as well. I have heard of this problem in desktop computers and thought there was a setting I could place in the NET.CFG file at the workstation or on the file server that would fix the problem.**

Check to see if there are any other programs running on your laptop that could be causing the problem. It is possible that if you are running a disk cache program that flushes the buffers near the 5MB level. Caching programs such as these may turn off the interrupts and take control of the CPU for long intervals. This can lead to the workstation being unable to respond to Watchdog packets from the server and to the workstation losing packets coming from the server to the workstation. Some advanced memory management configurations coupled with this type of caching program can further aggravate the situation. First try performing the file transfers without any memory management or the caching program. Then start reading the components one at a time until the problem reoccurs. It is also possible that if your laptop is powering down due to system inactivity.

# Workstation Connectivity Q & A: Network Busy Errors with VLMs

**I have users who are complaining of Network Busy messages in Windows when they are logged into the LAN. They don't have the problem when they are logged out or are using NETX instead of the Virtual Loadable Modules. What is the problem?**

Make sure you have the latest Windows DLLs and 386 drivers. Check the workstation's AUTOEXEC.BAT file to see that the TEMP variable is set and that it points to a valid directory. Verify that you have the latest VLMs available from NetWire. Check the directory for the presence of any files. If you find any, this could be causing the problem. This directory should be empty unless the workstation hangs and hasn't cleanly exited to DOS.

## Workstation Connectivity Q & A: Suppressing NetWare Logo Using VLMs

**Since converting to using Virtual Loadable Modules (VLMs) users are complaining that the time it takes to display the NetWare logo delays the execution of Windows. Is there a way to suppress or disable the display of the logo?**

Each user should have a NETWARE.INI file in his or her Windows directory. Placing a DISABLE LOGO=YES command under the [Options] header will prevent the NetWare logo from displaying.

## Workstation Connectivity Q & A: Windows for Workgroups and Server Utilization

**I have installed Windows for Workgroups on the server. I have heard that there will be spikes in server utilization for approximately 20 seconds when a user starts up. Are there other load considerations I should be aware of?**

When running Windows for Workgroups from the server on an Ethernet network, network segmentation becomes very important. Having users spread over multiple network adapters should reduce the number of packet collisions that you might encounter and will help keep the throughput as high as possible. Make sure the server and the workstations have the latest drivers to help keep the communications flowing as smoothly as possible. The same problems should not occur on token-ring or ARCnet networks.

# Workstation Connectivity Q & A: DOS Client Problem

**I have a small LAN using NETX version v3.01. I recently upgraded from DOS 3.3 to DOS 6.2 on each of the two PCs. Despite the upgrade, the network still shows DOS 3.3 as being resident. The network server has not yet been upgraded to DOS 6.2. How can I get the workstations to report the correct version of DOS? What precautions do I need to take when upgrading the server's DOS partition?**

You need to download NET33X.EXE from NetWire on CompuServe or via FTP from ftp.novell.com. You have a very old version of NETX and this is contributing to your problem of not seeing the correct version of DOS. This version of NETX was released long before DOS 6 came about. After upgrading to the latest version of NETX, you will probably need to delete the entry in the SETVER table on your machine for NETX to see the correct version of DOS. Enter SETVER NETX.EXE /D at the DOS prompt on the workstation, press the Enter key, and reboot the workstation. NETX should now report that it is running on DOS 6.2. Unless you are planning to have more than two hard drives on the server, there is no reason to upgrade the version of DOS you have. Versions of DOS Prior to 5.0 would only support two hard drives. It is not unheard of for a server not to boot up if it had more than two hard drives and a version of DOS prior to 5.0. If you will be adding additional hard drives, you will need to upgrade the servers' DOS partition to DOS 5.0 or later. One of the problems you may see if this isn't done is that the server may refuse to boot or complete the post process when multiple hard drives are detected.

## Workstation Connectivity Q & A: Workstations Hanging during Broadcasts

**I am having problems with some users. Their workstations hang or freeze when they receive a network broadcast message. If the workstations don't hang, they usually receive a message that the printer is offline. The users' only option is to reboot the workstation. Pressing Ctrl-Enter won't clear the message. How do I fix this?**

On a NetWare v2.x or v3.x network, the user can issue a CAST OFF ALL command from the command line. On a NetWare 4.x network, the user can enter a SEND/N=A command, which will reject all messages. Other users have reported this problem, and upgrading from NETX to Virtual Loadable Modules (VLMs) has fixed the problem in some cases. Be sure you have the latest LSL and IPXODI files on the workstation, as older versions of these files could contribute to the problem.

# Workstation Connectivity Q & A: Ethernet 5-4-3 Rule

**A friend told me there is a set of rules called the 5-4-3 rule that applies to configuring Ethernet coaxial cable networks. What is this rule?**

Coined by Standard Microsystems Corp., a manufacturer of Ethernet adapters and concentrators, the 5-4-3 rule applies to coaxial as well as unshielded twisted-pair Ethernet networks. Applying this rule, no more than five segments may exist. No more than four repeaters can connect these segments. No more than three of these five segments may be populated. In a coaxial Ethernet network, up to 30 workstations can exist per segment.

# Workstation Connectivity Q & A: ARCnet and Token-Ring Routing

**I have a server that has been running on ARCnet for some time. Recently I added a token-ring adapter to the server to connect the ARCnet network to the company backbone. After adding the token-ring adapter, the ARCnet segment slowed considerably. The server utilization shown in MONITOR.NLM is less than 12 percent. The ARCnet network will be in place for some time, because funding limitations do not allow us to upgrade it. I have noticed that unloading the token-ring driver allows the ARCnet network to speed up.**

Since unloading the token-ring driver eliminates the problem, there are a couple of areas to look at. Make sure you have the latest drivers for both the ARCnet and token-ring adapters. Check to see that you don't have any hardware conflicts (such as interrupts, I/O address ranges, or shared memory addresses). If you have spare adapters available from other vendors, try different ARCnet and token-ring adapters. Compatibility issues between certain hardware vendors may exist.

## Workstation Connectivity Q & A: NWDLL2.EXE and Dynalink Problem

**Since installing the dynamic link libraries (DLL) from NetWare NWDLL2.EXE, I receive a dialog box that says "Undefined Call to Dynalink" when I execute a program that has to make calls to the network. After replacing the DLLs with the original versions, I still have this problem. Did I miss something? What can I do?**

After confirming that you have the original DLLs in place, check to see that you have the correct VIPX.386 and VNETWARE.386 files in the WINDOWS\SYSTEM directory (if you are running Windows on the workstation). Be sure to check the Windows Setup to see if it indicates the correct version of NetWare or the shell version in use. This error message indicates that you are using a version of the DLLs or .386 files from the Virtual Loadable Modules (VLMs) that are intended for NETX.

# Workstation Connectivity Q & A: TCP/IP and Packet Forwarding

**I have two network adapters in my server, with the TCP/IP protocol stack bound to both. Workstations on each adapter can ping the adapter in the server they are attached to but not the remaining adapter in the server. I tried putting the IP ROUTER statement in the NET.CFG file, but it didn't help. Is there something I am missing?**

The first thing to check is that you have TCP/IP loaded on the server with FORWARD=YES on the command line in the AUTOEXEC.NCF file. The default for TCP/IP in the NetWare environment is not to route Internet Protocol (IP) traffic. It is also a good idea to check that you have the latest versions of the LAN drivers for the network adapters in the server. Older drivers can sometimes have problems routing protocols other than IEEE 802.3. If you are using a subnet mask other than the default for the IP class being used, make sure that the workstation is also using the same subnet mask in its NET.CFG file.

## Workstation Connectivity Q & A: dBASE4 and VLMs

**Since upgrading our workstations to use Virtual Loadable Modules (VLMs), dBASE4 presents error messages that it "can't access files." When we switch back to NETX on our workstations, everything is fine. Is there a trick to running dBASE4 with VLMs?**

It is possible that dBASE4 may not be compatible with the VLMs, depending on what type of application program interface (API) calls the dBASE4 programmers used to write the program. First, get the latest version of the VLMs from a NetWare 4.10 server or from NetWire. Then, make sure you get the latest updates to the VLMs. Check the documentation that is available on NetWare 4.10 or v3.12 and set the Read-Only compatibility to ON, which may make dBASE4 more tolerant of the environment it is running on.

# Workstation Connectivity Q & A: IPX and IP Integration

**Our corporate backbone uses the Internet Protocol (IP) almost entirely for communications. Most of the workstations use the Internetwork Packet Exchange (IPX) protocol to talk to the servers that are local to them. How can those workstations talk to remote servers without using IPTUNNEL.LAN?**

For just a few server connections, IPTUNNEL.LAN may be your best choice. It becomes a problem when you are using it for most of servers on the LAN because of the performance load it presents on the server and the increased traffic caused by the Service Advertising Protocol (SAP). NetWare/IP allows you to run an IP backbone between servers and extend IP communications to the desktop. The workstations will still see their usual F: drive prompt, but they will be talking to the server using TCP/IP instead of IPX.

## Workstation Connectivity Q & A: NETX vs. VLMs

**My users are currently using NETX to talk to our NetWare v3.12 server. Is there an advantage to using Virtual Loadable Modules (VLMs) to do this instead?**

VLMs may offer better memory management (i.e., more conventional RAM is available) than is possible with NETX. By using VLM.EXE on the workstation, you are in a better position to make the change to NetWare 4.10 with minimal changes to each workstation. If you need to use packet burst technology, VLMs are your only choice. VLMs also fix other problems, such as workstations locking up when broadcast messages are received.

## Workstation Connectivity Q & A: Windows and IPX, Tips for Windows on a LAN

**My users use Windows 3.1. Are there specific versions of IPX and NETX I should use? Also, do you have any tips for running Windows on a NetWare LAN?**

The latest IPX and NETX files can be downloaded from NetWire on CompuServe. NET33X.EXE, a self-extracting file, can be downloaded from the NOVFILES forum on NetWire. You should be aware that Novell has announced that it will no longer provide updates to NETX, and they encourage organizations to plan to migrate to the VLM client architecture. VLMs are modularized and replace the NETX shell.

Many organizations still use IPX.COM and NETX.COM because they do not run multiple protocols on the same network adapter at the workstation. In addition, many overworked network administrators still chant the old adage "If it ain't broke, don't fix it." However, some of the older drivers don't work well with newer applications on the market today. In fact, some recent applications were written to interact with VLMs on the workstation.

With Novell's decision not to provide future upgrades to NETX.COM, you may want to revisit your thoughts on upgrading to VLMs in the future. Also, if you're planning to run Windows on the LAN, VLMs will provide your Windows users with an improved way of accessing NetWare services from within Windows (i.e., drive mappings and print queues).

NetWire recently released a new naming scheme for its client workstation and Windows upgrade files. If you were familiar with DOSUPX and WINUPX, you'll need to know the new naming scheme. The last versions, DOSUP9.EXE and WINUP9.EXE, have been removed. CompuServe has a filename length limitation of 6.3 characters, unlike DOS's 8.3 characters. Since future revisions would exceed that limit (unless NetWire switched to hexadecimal representation: WINUPA.EXE), Novell decided to take the opportunity to restructure the file names.

DOSUPX.EXE has been split into two files: NET33X.EXE and VLMUP2.EXE.

WINUPX.EXE has been split into two files: WINDR2.EXE and NWDLL2.EXE.

Below is a table of files you need to download, depending on whether you use

DOS or Windows on the workstation.

| DOS | v2.x/v3.x | 4.02 | 4.10 |
|---|---|---|---|
| NETX/IPX | NET33X.EXE | NET33X.EXE | NET33X.EXE |
| NETX/ODI | NET33X.EXE | NET33X.EXE | NET33X.EXE |
| VLM/ODI | VLMUP2.EXE | VLMUP2.EXE | Ships w/ latest |

| *Windows* | | | |
|---|---|---|---|
| NETX/IPX | NET33X.EXE | NET33X.EXE | NET33X.EXE |
| | WINDR2.EXE | WINDR2.EXE | WINDR2.EXE |
| | | NWDLL2.EXE | NWDLL2.EXE |
| | | | |
| NETX/ODI | NET33X.EXE | NET33X.EXE | NET33X.EXE |
| | WINDR2.EXE | WINDR2.EXE | WINDR2.EXE |
| | NWDLL2.EXE | NWDLL2.EXE | NWDLL2.EXE |
| | | | |
| VLM/ODI | VLMUP2.EXE | VLMUP2.EXE | Ships w/the latest |
| | | WINDR2.EXE | WINDR2.EXE |
| | | NWDLL2.EXE | * |

*If you're using NWADMIN.EXE v4.06, use the client kit DLLs that ship with NetWare 4.02.

# Workstation Connectivity Q & A: File Server Not Found

**When I try to log into the server after loading NETX, I get the message "A file server could not be found." What causes this and what do I need to do to fix it?**

Loading the NetWare NETX shell sends out a broadcast message on the network "Get Nearest Server." Servers that receive this message send a "Give Nearest Server" message back to the workstation. The workstation attaches to the first server that responds. If the workstation does not receive a reply from any servers within a specified amount of time, it will retry the number of times that is set in the "IPX retry count." The default is twenty retries If after twenty retries there are no replies from any servers, the message "A file server could not be found" appears.

Many components of a network could cause this error message to occur, such as a workstation, a file server, or wiring. Let's look at a few steps you can take to narrow down your search:

1. Communications
    a. How many workstations are involved?
    b. If many, is a file server, bridge, or router down?
    c. If many, are any common cable routes disconnected?

2. File Server
    a. Is the file server up and running?
    b. Is IPX bound to the adapter in the file server?
    c. Have you exceeded the number of user licenses for this server?
    d. Use TRACK ON to see if the file server is receiving the broadcast message from the workstation and returning the "Give Nearest Server" response.

3. Workstation
    a. Does the frame type in NET.CFG match the frame type in the server?
    b. Does IPX or IPXODI load properly?

## Workstation Connectivity Q & A: Disk Full Error after Upgrading to VLMs

**I upgraded to VLMs recently. On one of the workstations I receive the error message "Windows cannot write to this file. Disk may be full." I've increased the number of file handles in this workstation, but I still receive this error message. What's wrong and how do I fix it?**

When you mention that you have increased the number of file handles on this workstation, does that include the CONFIG.SYS file? VLMs don't use File Handles statements in NET.CFG files anymore.

You may need to reinstall the requester. If you issue the CAPTURE statement before going into Windows and the problem is resolved, try reinstalling the VLMs.

This problem can also result from the Windows temporary directory being full.

# Workstation Connectivity Q & A: OS/2 Warp Requester Version

**I recently installed OS/2 Warp on my workstation. What version of the requester do I use?**

First let's discuss IBM and Novell's position on OS/2 Warp support. You only want to use a version that is supported by both Novell and IBM. Novell and IBM have agreed to support calls on OS/2 Warp v3.0 with the NetWare Client for OS/2 v2.10. Novell officially will support the NetWare Client for OS/2 v2.11. We recommend that you use the v2.11 version only.

The NetWare Client for OS/2 v2.11 consists of seven self-extracting files:

| | |
|---|---|
| WSOS21.EXE | Installation program files |
| WSOS22.EXE | Requester files |
| WSOS23.EXE | Windows libraries and Remote Program Load (RPL) files |
| WSDRV1.EXE | LAN driver files |
| OS2UT1.EXE | Files for MAP, SYSCON, CX, etc. |
| OS2DC1.EXE | Documentation in OS/2 IPF format files |
| OS2VMB.EXE | Virtual Loadable Module (VLM) boot disk image files |

Novell has a faxback service that is accessible 24 hours a day, seven days a week. The toll-free number is (800) NET-WARE.

1. Press 2 for technical support.

2. Press 2 for technical documents via faxback.

The faxback service provides documents that cover OS/2 issues. The OS/2 documents are numbered 2,001 through 2,009. These are some of the documents available:

| | |
|---|---|
| Document #2007 | NetWare and IBM requesters on token-ring |
| Document #2008 | NetWare and IBM requesters on Ethernet |
| Document #2009 | OS/2 latest fixes |

## Workstation Connectivity Q & A: Changing File and Directory Attributes



**How do I change the attributes of a file and a directory?**



These are the utilities you use to change file and directory attributes in NetWare v3.x:

FLAG          DOS command line utility to change file attributes

FLAGDIR       DOS command line utility to change directory attributes

FILER         Menu-driven utility

File and directory attributes override <u>trustee assignments</u> at the user and group level. However, users must have rights to a file or directory before they can take advantage of the file attributes.

You can modify or assign the following attributes to files in NetWare v3.x:

A          <u>Archive Needed</u>--used for backups

CI         <u>Copy Inhibit</u>--used for Macintosh users

DI         <u>Delete Inhibit</u>--file can't be deleted (Macintosh)

X          <u>Execute Only</u>--file can be executed only

H          <u>Hidden</u>--file can't be seen in DOS DIR command

RA         <u>Read Audit</u>--tracks reads to a file

RO         <u>Read Only</u>--can view file only

RW         <u>Read Write</u>--can view, edit, or rename file

R          <u>Rename Inhibit</u>--can't rename file (Macintosh)

S          <u>Shareable</u>--multiple users can share file

SY         <u>System</u>--system files only

T    <u>Transactional</u>--used to track transactions to completion

WA   <u>Write Audit</u>--tracks writes to a file


You can modify or assign the following attributes to directories in v3.x:

D    <u>Delete Inhibit</u>--directory can't be deleted

H    <u>Hidden</u>--directory can't be seen in DOS DIR command

P    <u>Purge</u>--all files in directory are automatically purged
     when deleted

R    <u>Rename Inhibit</u>--can't rename directory

SY    <u>System</u>--defines system directories


These are the utilities in NetWare 4.x you use to change file and directory attributes:

FLAG  In 4.x, Novell combined several utilities from v3.x like
     FLAG and FLAGDIR into the FLAG command. FLAG is
     still a DOS command line utility, but now can be used to
     modify directory attributes as well as file attributes.

FILER  Menu-driven utility that combines several utilities from
     v3.x, such as SALVAGE, PURGE, etc., into one utility.

In addition to the v3.x file and directory attributes, in 4.x, you can modify the following file and directory attributes:

CC   <u>Can't Compress</u>--Based on requirements set by the
     administrator, this file can't be compressed because it
     doesn't save enough space.

CO   <u>Compress</u>--This is a compressed file.

DC   <u>Don't Compress</u>--Don't compress this file or directory.

DM   <u>Don't Migrate</u>--Don't migrate this file or directory.

IC    <u>Immediate Compress</u>--The file or files in this directory
     are marked for immediate compression.

# Workstation Connectivity Q & A: Creating a Diskless Workstation

**How do I create a diskless workstation and connect the workstation to a NetWare file server?**

When a DOS-based workstation boots, it goes through a boot process that checks the system BIOS, checks for an AUTOEXEC.BAT and a CONFIG.SYS file, and performs other startup procedures. Connecting that same workstation to the network requires you to load network drivers locally that interact with the network adapter, which in turn communicates with the rest of the network.

Changes on the Workstation

1. Install a Remote Reset programmable read-only memory (PROM) or boot from a chip on the network adapter in the workstation. Locate directions to do this in the adapter documentation.

2. Run the DOSGEN utility to copy the workstation's boot files to the file server. The files will be stored as a boot image file (NET$DOS.SYS) on the server.

Changes on the File Server

1. The file server receives the NET$DOS.SYS boot image file of the workstation and places it in the SYS:LOGIN directory.

2. If you are using only one diskless workstation, you are finished. If you are using more than one, you will obviously need to identify each workstation using a unique name from NET$DOS.SYS.

3. Rename the NET$DOS.SYS image file for each diskless workstation to something meaningful (i.e., JIM.SYS, NANCY.SYS, etc.).

4. Create a BOOTCONF.SYS file in the SYS:LOGIN directory that provides the following information: IPX network number, node number, and image file name (i.e., JIM.SYS). This is a text file that identifies which boot file to load for each workstation.

# Workstation Connectivity Q & A: Black Screen of Death

**My Windows users get a black screen with a blinking cursor in the upper-left-hand corner when they try to use a DOS application. What is happening and how do I fix it?**

It sounds like your users are experiencing the well-known problem called the black screen of death (BSOD). The problem can be recreated using the following files and versions: VNETWARE.386 v1.06 and NETX.EXE v3.31. The old method of solving this problem was to revert to the older VNETWARE.386 v1.04 and NETX.EXE v3.26. However, we don't like to go backwards in versions unless absolutely necessary.

Fortunately, new drivers that solve this problem are available on CompuServe in the NOVFILES forum. At the time of this publication, the latest version of VNETWARE.386 is 2.04, dated 08-17-94. To update to the latest Windows drivers, access CIS NOVFILES and download the following files: WINDR2.EXE and NWDLL2.EXE. To update the clients, download one of the following files: NET33X.EXE or VLMUP2.EXE.

VNETWARE.386 is the driver that enables your DOS applications to run on the network under Windows. NETX.EXE is the shell on the client workstation that intercepts network commands and redirects them over the network. Novell is recommending that organizations upgrade the clients to the newer VLM architecture, because it will no longer provide upgrades to NETX.EXE.

## Workstation Connectivity Q & A: CASTON and CASTOFF in NetWare 4.x



**What are CASTON and CASTOFF? I recently upgraded to NetWare 4.x and can't find these utilities?**



CASTOFF is used by a workstation to avoid receiving messages sent by other users. When a user sends a message to another workstation, it first is sent to the file server. The server looks up the recipient's address via its connection table. CASTOFF sets a bit in the server's connection table that tells the server to prevent messages from being sent to that workstation.

Using CASTOFF by itself does not preclude the server from sending its own messages to the workstation. To avoid receiving user messages and server console messages, the workstation should use CASTOFF ALL. CASTOFF ALL changes a bit in the NetWare shell at the workstation instead of in the server's connection table. This means that the messages are forwarded by the server to the workstation, and the shell does not display the messages. The shell keeps the first message it receives after the CASTOFF ALL command is issued, and discards any further messages. When CASTON is issued, the shell displays only the first message it kept at the workstation.

Windows users will have to modify their configuration for CASTOFF ALL to work properly. This is because Windows' has its own enable/disable messages option that sets a bit in the shell. If the Windows option to receive messages is enabled, it will change the bit in the shell to display messages, thus overriding the CASTOFF ALL command.

To change the Windows option (from within Windows) so that CASTOFF ALL works properly:

1. Open the Control Panel.

2. Choose Networks.

3. Change the ENABLE option to DISABLE.


If you prefer to change the option from DOS:

1. Edit the NETWARE.INI file.

2. Locate the [OPTIONS] section.

3. Add the line "MESSAGES=0."

The CASTON command is used to signal the server that the workstation now wants to receive messages. It changes the bit in the server's connection table.

NetWare 4.x

In NetWare 4.x, CASTON and CASTOFF have been combined with the SEND command into a newer version of the SEND command. The syntax for a SEND in 4.x is as follows:

   SEND ["message"[TO] [username | groupname | servername ]] [/A=[A |     N | C | P]] [/P] [/S] [/?]

in which:

   /A=A or /A     Workstation receives all messages.

   /A=C          Workstation receives messages only from the server.

   /A=P          Workstation will poll server for messages.

   /P             Workstation will poll server for last message sent.

   /S             Workstation shows the current broadcast mode.

   /?             Workstation displays help for the SEND command.

# Workstation Connectivity Procedure List

[Connecting a Workstation to the Network](#)

[Resolving Slow Workstation Performance on a Network](#)

## Workstation Connectivity Procedure: Connecting a Workstation to the Network

1. Install a network adapter in the workstation.

2. Configure it to avoid IRQ, I/O, or DMA conflicts with other devices present in the workstation.

3. Connect the network adapter to the cabling system for the LAN.

4. Install the client software from diskette (prepared by using the INSTALL.NLM on a NetWare v3.12 or 4.10 server).

5. Reboot the workstation and log into the network.

## Workstation Connectivity Procedure: Resolving Slow Workstation Performance on a Network

1. Try a different network cable.

2. Try a different adapter in the workstation.

3. Try updated ODI drivers.

4. Try an updated network adapter driver.

5. If using VLMs, try using PB BUFFERS = 0 under the NetWare DOS Requester header in the NET.CFG file.

6. Try removing any DOS TSRs that are being loaded at the workstation.

## Workstation Connectivity Requirements

- Network adapter that matches the access method in use (i.e., Ethernet coax, 10BASE-T, token ring, etc.)

- LAN drivers for the adapter to initialize and establish a connection to the server

- Cable to connect the network adapter to the topology in use

## Workstation Connectivity Utilities

[AuditTrack v2.04 (Free 30-Day Trial) from On Technology](#)

[John T. McCann's SofTrack (Free 30-day Trial) from On Technology](#)

[NetTunePRO from HawkNet](#)

[NENV10 and NLOGIN by Darwin Collins](#)

[NMENU335 by Dirk Engelhardt](#)

[WHOHASIT by Andrew Cobb](#)

[WINMENU GE v2.4 for All Networks](#)

[WINMENU v6.05 for Novell 3.x Networks](#)

# Workstation Connectivity Utility: NMENU335 by Dirk Engelhardt

NovMenu v3.35 is a menu system for NetWare.

To install it, copy the directory \PROGRAMS\NMENU335 to the SYS:SYSTEM directory on your file server.

## Workstation Connectivity Utility: WHOHASIT by Andrew Cobb

WHOHASIT displays the files a workstation is using on a NetWare network, including volume use. It also allows you to send broadcast messages.

To run it, copy the directory \PROGRAMS\WHOHASIT to your hard disk. WHOHASIT is a Windows utility. To install it, type WHOHASIT.EXE from the File Run option in Windows.

## Workstation Connectivity Utility: WINMENU GE v2.4 for All Networks



Requires Windows 3.1 or above.

Winmenu is a state-of-the-art menu program for Windows users designed to facilitate access to all applications and provide authorized access for the users. LAN sites that are contemplating to move to the   Windows environment will find Winmenu a must. Winmenu provides easy and intuitive access without the complications of the Program Manager. The greatest advantages of Winmenu are its ability to ease administration tasks and provide authorized access based on the group codes the user belongs to. It is cost-effective and looks great!

Please read the WINMENU.TXT file for more information.

To install it, copy the D:\PROGRAMS\WINMENUG directory to your hard disk.

Copyright by Ricky Freyre, 1995 / All rights reserved.
Compuserve# 70154,2635
Internet:   70154.2635@compuserve.com

## Workstation Connectivity Utility: WINMENU v6.05 for Novell 3.x Networks

Requires Windows 3.1 or above.

Winmenu is a state-of-the-art menu program for Windows users designed to facilitate access to all applications and provide authorized access for the users. LAN sites that are contemplating to move to the   Windows environment will find Winmenu a must. Winmenu provides easy and intuitive access without the complications of the Program Manager. The greatest advantages of Winmenu are its ability to ease administration tasks and provide authorized access based on the group codes the user belongs to. It is cost-effective and looks great!

Please read the WINMENU.TXT file for more information.

To install it, copy the D:\PROGRAMS\WINMENUN directory to your hard disk.

Copyright by Ricky Freyre, 1995 / All rights reserved.
Compuserve# 70154,2635
Internet:   70154.2635@compuserve.com

## Workstation Connectivity Utility: NENV10 and NLOGIN by Darwin Collins

This package documents the methods we use to automatically maintain the workstation network drivers, applications, and other workstation files.

It also includes NLOGIN.EXE, a NetWare 4.1 utility, that makes it easier for users to login to a NetWare 4.10 server. NLOGIN.EXE will search the user's 'short' login name in the NetWare Directory Services (NDS) tree and return the full NDS name so that it can be used for Novell's LOGIN.EXE. The purpose of this package is to aid other Network administrators in setting standards, batch files, and utilities and to make the maintenance of workstation network drivers and miscellaneous files painless.

For example, whenever, we receive a newer mouse driver, VLMUP*, or Windows 3.1 patches, we can easily distribute these files to all our workstations. (We usually test them for a week or two on one server before we copy them to other servers and sites).

However, for more complicated installations or anything to do with Windows, such as Lotus SmartSuite, Novell's WIN2NCS, CorelDraw, PCAnywhere, SPSS for Windows, or the Oracle client, we use a package called WinInstall 4.0. You can obtain WinInstall 4.0 by contacting us at (301)270-4458 or CompuServe 71371,635.

To install these utilities, copy the D:\PROGRAMS\NVEN10 directory to your hard disk.

Please read the README.TXT file for more information.

## Workstation Connectivity: AuditTrack v2.04 from On Technology (Free 30-Day Trial)



AuditTrack v2, a NetWare network auditing product, is a network surveillance system that allows LAN administrators to track and identify all login, file, remote access and bindery activity occurring anywhere on a NetWare network.

To install this software, copy the directory D:\PROGRAMS\AUDITTR to your hard disk. Then run the SETUP program from the Windows Program Manager File Run command line. If your hard drive is designated as drive C, type C:\AUDITTR\ setup.exe and choose OK.

## Workstation Connectivity Utility: John T. McCann's SofTrack from On Technology (Free 30-day Trial)



SofTrack, a software metering package, includes native support for Novell's NetWare Directory Services (NDS).

To install this software, copy the directory D:\PROGRAMS\SOFTRACK to your hard disk. Then run the INSTALL program from the Windows Program Manager File Run command line. If your hard drive is designated as drive C, type C:\softrack\install.exe and choose OK.

## Workstation Connectivity Utility: NetTunePRO from HawkNet

NetTune PRO is performance tuning and monitoring software for NetWare 4.1.

You can receive an evaluation of this product from HawkNet's World Wide Web site at http://www.hawknet.com/~netinfo.

+++++++++

## Internetworking

**CD HELPdesk Series: Novell Products**

Click on any icon for more information

## Internetworking Q & A

[Definition of Packet Burst](#)

[Internal vs. External Routers](#)

# Internetworking Q & A: Internal vs. External Routers

**What is the difference between an internal and an external router? In what cases would I use each?**

Routers connect different network segments and operate at the Network Layer (Layer 3) of the OSI Model. As such, they must receive their information from a Network Layer protocols. In NetWare, this network layer protocol is IPX**.** A network segment connected to a router must have its own unique IPX network number. A router can interconnect network segments of different types (i.e., Ethernet to token-ring.

Novell, in the past, has incorrectly labeled its NetWare routers as bridges. It has cleared up this confusion by properly naming them as routers, regardless of whether they are internal or external routers.

The difference between an internal and external router is the location where the router resides. An internal router is represented by two or more network adapters that reside inside the NetWare file server, where the server's network operating system handles the exchange of data between networks. You should only use an internal router if the network is small and handles a low volume of traffic. Otherwise, you could overtax your file server.

An external router is a device, such as a PC, separate from the server but connected to the network. Software running on the PC or other device handles the exchange of data between networks. One network adapter must be placed in the PC or device for each network segment you need to interconnect. It is generally advisable to use a dedicated external router whenever possible and affordable so as to reduce the load on the file server.

# Internetworking Q & A: Definition of Packet Burst

**How do I use packet burst? What is it?**

Before we give the technical use and explanation of packet burst, we'll give a common everyday example that is similar.

Imagine you want to check out twenty books from the library. You check out the first book, carry it to the car, drive home, deposit the book, and drive back to the library to check out the next book. You continue in the same fashion until all the books are checked out and you have twenty books at home.

That's the way NetWare v3.11 and below handled NetWare Core Protocol (NCP) requests. For each request of 512 bytes of data, the requester had to wait for a response before issuing the next request. So, to request 8 kilobytes (KB) of data, thirty-two transactions were necessary.

As connecting networks across Wide Area Networks (WANs) became more prevalent, this method proved too slow. In addition, the overhead involved introduced more traffic on the WAN links. Packet burst was designed to eliminate the request/response nightmare. Instead, the client could issue a single "burst" read of the entire 8KB. Packet burst permits NCP to burst up to 64KB of data in each request.

So, in our library example above, with packet burst technology, you could now check out all twenty books at one time and take them home in a single trip.

In addition to packet burst, Novell introduced another product, Large Internet Packet (LIP) , to improve performance over the WAN. When a router separates a client and a server, the 576-byte IPX packet limit is removed.

In NetWare v3.11, Novell combined packet burst and LIP into the single PBURST.NLM. You will find PBURST.NLM v3.12 and 4.x products as well.

If your network requires you to access other NetWare servers across a WAN, you will want to implement PBURST.NLM, especially if your links are slow. Also, PBURST.NLM must be loaded on both servers involved in the communication to work. Ordinarily, when two servers are separated by a router, politics are involved in adding anything to another administrator's server. However, since this involves speeding up the network communications, you shouldn't run into too much trouble.

Neither PBURST or LIP affect SPX traffic.

## Internetworking Procedure List

[Router Tracking Screen to Find IPX Internal Numbers](#)

[Router Tracking Screen to Find Media Access Control (MAC) Address of Network Adapter](#)

[Router Tracking Screen to Find Network Number](#)

## Internetworking Procedure: Router Tracking Screen to Find MAC Address of Network Adapter

1. Go to the server console or use RCONSOLE.EXE from DOS.

2. At the console, press Alt-Esc; in RCONSOLE, use the numeric keypad minus (-) key to get to console prompt (:).

3. Type TRACK ON.

4. Reboot the network workstation. Watch the screen for a Get Nearest Server request.

5. Pause the screen by pressing any key.

6. Write down the number in the brackets to the right of the colon on the line that has the Get Nearest Server request.

7. This is the MAC address of the network adapter in the PC. Write it down for future reference.

8. Use Alt-Esc at the console or the numeric keypad minus (-) key in RCONSOLE to return to the console prompt (:).

9. Type TRACK OFF.

10. Leave the console or quit RCONSOLE.

## Internetworking Procedure: Router Tracking Screen to Find Network Number

1. Go to server console or use RCONSOLE.EXE.

2. At the console use Alt-Esc; in RCONSOLE use the numeric keypad minus (-) key to get to console prompt(:).

3. Type TRACK ON.

4. Watch the screen for data.

5. Pause the screen by pressing any key.

6. Look for the line that has a server's internal IPX number to the right and has to the left. (The number to the left of the colon (XXXX) is the network number.)

OR

1. While watching the screen, look for a Get Nearest Server request.

2. Write down the number inside the brackets and to the left of the colon(:). It is the network number.

3. At console use Alt-Esc; in RCONSOLE, use the numeric keypad minus (-) key to get to the command prompt (:).

4. Type TRACK OFF.

5. Leave the console or quit RCONSOLE.

## Internetworking Procedure: Router Tracking Screen to Find IPX Internal Numbers

1. Go to the server console or use RCONSOLE.EXE in DOS.

2. At the console, use Alt-Esc; in RCONSOLE, use the numeric keypad minus (-) key to get to the command prompt (:).

3. Type TRACK ON.

4. Watch the screen for incoming and outgoing router packets.

5. When the screen has packets, press any key to pause the screen.

6. Look for the line that has the file server name on it and, to the left, a set of brackets with a colon in the middle.

7. The number to the right of the colon should be 000000000001.

8. The number to the left of the colon is the internal IPX number of the server whose name is on the line.

9. Write down the number for reference.

10. Use Alt-Esc at the console or the numeric keypad minus (-) key to return to the command prompt (:).

11. Type TRACK OFF.

12. Leave the console or quit RCONSOLE.

+++++++++

## Database



**CD HELPdesk Series: Novell Products**

Click on any icon for more information

Q+A    PROCEDURE LIST    VENDOR LIST

## Database Q & A

[Database Management System (DBMS) Definition](#)

[Database Server Definition](#)

[Definition of Btrieve](#)

[Hardware Platforms Available for Database Servers](#)

[Navigational Database Definition](#)

[Object-Oriented Database Definition](#)

[Relational Database Definition](#)

[Structured Query Language (SQL) Definition](#)

# Database Q & A: Relational Database

**What is a relational database?**

A relational database is one that represents data as a collection of tables. Developers are shielded from the often complicated underlying data structure, and are left simply to deal with tables.

A relational database can be visualized similar to a spreadsheet file. A table of data contains rows and columns. The rows comprise database fields such as name, address, city, state, etc.; columns represent the value of those fields. Let's look at two examples of simplified tables:

Table 1:

| | |
|---|---|
| CUSTOMER NAME | Huggans Consulting |
| PO NUMBER | AUS101 |
| ITEM NUMBER | 123456 |
| DATE | 8/7/95 |
| AMOUNT | $5,000.00 |

Table 2:

| | |
|---|---|
| CUSTOMER NAME | Huggans Consulting |
| ADDRESS | 123 Fancy Highway #1 |
| CITY | Bungalow |
| STATE | TX |
| ZIP | 08854 |

One table can relate to another table by the value of a field they share in common. In the examples above, Table 1 clearly relates to Table 2 because the value of both tables' CUSTOMER NAME field matches. Therefore, the data in Table 1 correlates to the data in Table 2. A user can generate a report by querying the tables and relating them on a common field value.

Typically, you would only have one record for a customer in an address table, but records in a purchase order table, you might have several that relate to the customer file.

With relational theory, routine queries usually involve more than one data file. In addition, two files can be used to generate a third file when extracting data that meets a certain criteria.

In hierarchical or non-relational systems, records in one file contain fixed pointers to records in another file. In this method, there is no need to compare the value of fields to form a relationship.

## Database Q & A: Object-Oriented Database

**What is an object-oriented database?**

Novell's NetWare Directory Services (NDS) is an object-oriented database. Those of you that have installed NetWare 4.x might be familiar with the objects used by NDS, such as user object, volume object, and server object. Clicking on an object reveals additional information about it. The information pertaining to the object can be altered if necessary.

The objects in the NDS tree could just as well be text-based names; however, objects or icons that represent objects are much easier to visualize and move around the network.

Object-oriented databases are becoming more common than relational databases because they are better suited for multimedia applications. In the object-oriented database, any type of data can be stored, such as data, text, voice, video, or pictures. Today's market is moving towards multimedia applications versus the older text, character-based, and numeric applications.

Relational databases are best suited for characters, etc., but can contain pictures (Binary Large OBjects, called BLOBs). Unfortunately, those pictures do nothing but sit in the field of the database unless the application accessing that picture contains routines that know what to do to display the picture.

Conversely, in an object-oriented database, an object (i.e., image object) might contain z itself to invoke routines that know to go and get the image file and run a routine to display the image. This gives more flexibility to applications, placing more emphasis on the objects.

## Database Q & A: Database Server

**What is a database server?**

A database server is simply a server that has as its sole function to perform database functions. Databases were originally designed as applications that ran on file servers. However, as more and more processing power was needed, the database functions were spun off the file server to increase database performance and to eliminate unnecessary bandwidth requirements on the network.

Database servers differ in design from their predecessors--database systems that sit on a file server. On the older systems, when a user placed a request to sort a database, the entire database was downloaded to the user's workstation, where the sort was performed, and then the entire database was sent back across the network to the file server. This older method involved a lot of traffic across the network, and was really slow if the network was busy.

Database servers (sometimes called database engines) solve this problem. First, the database server is set up as a dedicated server on the network: as a peer to the file server, instead of as an application on the file server. When a user requests a sort on a database, the database server performs the sort. This means that only the user's request travels across the wire, not the database. The user can query the database for records that meet certain criteria. The database server receives the query, extracts the records that meet the criteria, and returns only those records to the client. This method is much more bandwidth-efficient.

## Database Q & A: Navigational Database

**What is a Navigational database?**

The data model is the way in which a Database Management System (DBMS) abstracts data from a database and presents it to an application. The three data models in use today are navigational, relational, and object-oriented. Btrieve is an example of a Navigational database engine.

Navigational refers to the data access method that's used to "navigate" up, down, or sideways through data records. This method provides the developer with direct access to the data and knowledge of the underlying data structure, unlike the Relational model, in which the developer is shielded from knowing the data structure.

Btrieve Technologies has taken a unique approach in developing its MicroKernel Database Architecture (MKDA), which breaks the database model away from the low-level functions found in all databases. This means that using the MKDA architecture, it doesn't matter which data access model is used because the data is stored in a model-independent form.

## Database Q & A: Hardware Platforms Available for Database Servers

**What are the hardware platforms available for database servers?**

The hardware platform may well determine the overall efficiency of your database server. The following is a list of database server platforms to choose from:

- Intel-based single processor (i.e., IBM Model 90)--small organizations

- RISC-based single processor UNIX servers (i.e., IBM RS/6000 590)--medium-sized organizations

- Multiprocessor server (i.e., HP 9000, Compaq ProLiant 2000)--medium- to large-sized organizations

- Mainframe server--only if you have some hanging around

In most cases, the hardware platform selection will be driven by the database engine that will be used. Since a database server can process mission-critical transactions for an organization, utmost care should be involved in the planning stage. Server hardware prices can range from $50,000 to $200,000. The Compaq ProLiant 2000s, which cost $55,000 or so, house RISC-based processors. Note that we mentioned processors instead of processor. Multiprocessor servers are especially advantageous for database engines because the engines can be tied to specific processors, allowing the database to access the full resources of the processors without worrying about scheduling algorithms that can eat up clock cycles.

Another technology, called parallel processing, permits splitting a query into several queries and then distributing them among multiple processors (think of it like RAID). The distributed query, when finished, is reassembled. If your database server only has one processor, your technology options are limited. Depending on the combination of hardware and software, more than one CPU can be used.

# Database Q & A: Database Management System (DBMS)

**What is a Database Management System (DBMS)/**

A DBMS provides software tools to manage a database system. These tools can manage and administer data storage, retrieval, and security.

At one time, there wasn't much need for a network administrator to understand the dynamics of a DBMS, since most of these systems were on mainframes or UNIX boxes. As rightsizing occurs and more mission-critical applications are migrated to the LAN environment, it's important for LAN administrators to understand the basics of the DBMS.

The following features are found in most DBMS systems:

Database Design--Database design is done prior to input of data. Design uses a data definition language (DDL) called a database programming language. A DDL is used to construct the primary database. The structure of the primary database is stored by a maintenance tool in another database.

Data Administration--This is a way to manage access to the system. This is similar to managing the read/write access of users on a NetWare file server. Administration tools provide a way to limit or grant users varying levels of access to data.

Data Entry--This feature helps to control data entry. It can include user prompts or fancy data input screens.

Report Generation Tools--Programmers use these tools to provide canned reports for users of the system. These typically consist of the most frequently requested user reports.

"Ad Hoc" Query Tools--These tools help users to formulate queries to the database to generate reports that are not built into the system. It provides users with the flexibility to create their own custom reports.

Data Integrity Tools--Data integrity tools provide functions like rollback in a database in the event that a server crashes in the middle of a transaction. This is the equivalent of TTS in NetWare. NetWare's Transaction Tracking System (TTS) has built-in rollback and recovery at the I/O level of operations that ensures recovery from system or I/O glitches or failures.

# Database Q & A: Structured Query Language (SQL)

**So what is this thing called Structured Query Language (SQL)?**

SQL is pronounced "SQL" or "see qwill" and is provided by some Database Management Systems. SQL is a standard language used for creating, maintaining, and viewing data in a database. Believe it or not, two scientists, E.F. Codd and C.J. Date at IBM Corp., originally invented SQL for access to the company's mainframe databases. The American National Standards Institute (ANSI) promulgated a standard SQL definition for use across all computing platforms and operating systems.

Some of you may already be familiar with Scalable SQL (formerly NetWare SQL), by Btrieve Technologies. Scalable SQL is a relational database that scales your database applications from mobile notebooks to large client/server environments. Once you create an application for a Scalable SQL engine, you can deploy it in any configuration without rewriting a line of code.

## Database Q & A: Definition of Btrieve

**What is Btrieve?**

Btrieve is a record management system that includes server- and client-based products. Novell incorporated Btrieve as its database schema on a server, and later purchased the small company that designed it. Btrieve was recently spawned off on its own, with Novell retaining rights to package the database with NetWare servers. The new company is now called Btrieve Technologies and resides in Austin, Texas.

The Btrieve database resides on a file server. The record manager is software that manipulates the records in the database and provides data I/O and communications. The record manager software can reside on the server as a NetWare Loadable Module (NLM) or as a requester on a client workstation. Only the server-based software is provided with NetWare. The client-based software is only available as a developer's kit for an additional charge.

# Database Procedure List

[Enabling a Database File to Be Protected by TTS](#)

[Optimizing Performance of NLM-Based Database Operations](#)

## Database Procedure: Enabling a Database File to Be Protected by TTS

1. Identify the file(s) to be protected by TTS.

2. Change to the directory where the file(s) resides.

3. At the DOS prompt, type FLAG filename T and press the Enter key (replace filename with the name of the actual file).

4. Repeat Step 3 to protect additional files.

## Database Procedure: Optimizing Performance of NLM-Based Database Operations

1. Keep the cache buffers above 70 percent.

2. Verify you have the latest LAN and hard disk drivers loaded.

3. Set the maximum concurrent disk cache writes to a higher value if the environment is write-intensive, a lower value if it is read-intensive.

4. Set dirty disk cache delay time to a higher value if the write requests are small in size, a lower value if the write requests are large in size.

5. If most of the files on the database server will be large in size, setting the disk block size when the volume is created and the cache buffer size to larger than default values will allow for more information to be read or written at a time.

+++++++++

## Migration

## Migration Q & A

[Login Scripts and Trustee Assignments Don't Work After v3.11 to v3.12 Upgrade](#)

[Upgrading from v2.x to v3.x](#)

# Migration Q & A: Login Scripts and Trustee Assignments Don't Work after v3.11-to-v3.12 Upgrade

**I migrated our NetWare v3.11 server to v3.12 using MIGRATE.EXE 4.02, and now our e-mail packages, login scripts, and trustee assignments work improperly. What happened and what can I do to fix this?**

E-mail packages often correlate to the user ID. When migration is performed, it creates new users and user IDs in the bindery when they don't exist. Once detected, many administrators run BINDFIX on the old server and then copy the *.OLD file onto the new server and run BINDREST. Unfortunately, this may only solve the e-mail problem, while leaving problems with login scripts and trustee assignments. The reason for this is the random assignment of user IDs by the Migrate program. Unfortunately, the random IDs aren't so random, and some of the mail directories and trustee assignments from the first migration are still present.

To solve this problem, you'll need to do the following:

On the destination server:
1.  Delete all users except for Supervisor and Guest.
2.  Delete all groups except for Everyone.
3.  Run BINDFIX.

On the source server:
1.  Run BINDFIX twice.

NCOPY *.OLD from the source server to the destination server.

Run BINDREST on the destination server.

Now, run MIGRATE.EXE.

Notice that you are running MIGRATE.EXE after you place the bindery on the destination server. This prevents the MIGRATE.EXE program from generating not-so-random user IDs. If only the lottery worked this way!

## Migration Q & A: Upgrading from v2.x to v3.x

**I'd like to upgrade our NetWare v2.x server to v3.x. What's the best way to go about this?**

Although upgrading to newer versions of NetWare has, in the past, proven to be a tedious task for network administrators, that is not the case today. Novell provides two utilities that behave better than utilities of the past. The utilities, which can be found on CompuServe's NetWire or the Internet's World Wide Web, include the In-Place Upgrade NetWare Loadable Module (NLM) and the Across-the-Wire migration utility.

If you only have a few NetWare v2.x servers, you can use the In-Place Upgrade NLM (2XUPGRDE.NLM). This utility performs an upgrade on top of the same server. It works by taking a NetWare v2.x partition, reformatting the disk (without wiping out any data), and transforming that same disk into a NetWare v3.1x partition. Although the utility doesn't wipe out the data on the v2.x server, we always recommend that you perform a complete backup before trying any operation similar to this. No ifs, ands, or buts!

The other utility, Across-the-Wire migration (MIGRATE.EXE), is easier to use if you have more than a few servers, or if the servers are geographically dispersed. Instead of upgrading on top of the same server, at least two servers are involved in the upgrade process of one server. The utility migrates users and their environments from a source server to a destination server. MIGRATE.EXE is run from a workstation and the data is transmitted over the network. So, using this utility, you must have at least one extra server to start with.

## Migration Procedure List

[After Migration Steps](#)

[In-place Migration--Custom.](#)

[In-place Migration Standard (3.12).](#)

[Over-the-wire Migration STD.](#)

## Migration Procedure: Post Migration Steps

1. Update references to the server name and paths in the user login scripts.

2. Test applications. The paths and data may be wrong. Check the .INI files.

3. Check for the proper file distribution (that the correct files are in the correct subdirectories).

4. Update print servers and queues.

5. Check user restrictions for correct restrictions and paths.

6. If random passwords were chosen, print the NEW.PWD file. Otherwise, change the passwords or have the users change their passwords.

7. Test printing.

## Migration Procedure: In-Place Migration--Custom

1. Go to a workstation attached to the network.

2. Go to DOS.

3. Insert the migration diskette in the drive. (Note: This procedure is much faster if you copy the program disk to an empty subdirectory and run it from there.)

4. Run MIGRATE.EXE (from the subdirectory, if created).

5. Select Custom Migration.

6. Select Same-Server Migration.

7. Select the proper network operating system version on the file server (original).

8. Select the desired network operating system (destination).

9. Select the working directory (from the subdirectory, if created).

10. Use the Down Arrow key.

11. Select Pause after Errors and Warnings and press the Enter key.

12. Select Server and press the Enter key.

13. Select Type of Info to Migrate (you can use the F5 key to select multiple items).

14. Select Source Volume and press the Enter key.

15. Select Destination Server and press the Enter key.

16. Select Destination Volume and press the Enter key.

17. Press the Esc key when completed.

18. Select Random or No Passwords.

19. Press the F10 key.

20. Select Migrate to Working Directory.

21. Press the F10 key

22. View Migration Reports.

23. Press the F10 key.

24. Select Migrate from Working Directory.

25. Press the F10 key.

26. View Migration Reports.

27. Press the F10 key.

28. Exit to DOS.

## Migration Procedure: In-Place Migration--Standard (3.12)

1. Go to a workstation attached to the network.

2. Go to DOS.

3. Insert the diskette in the drive. (Note: This procedure is much faster if you copy the program disk to an empty subdirectory and run it from there.)

4. Run MIGRATE.EXE (from the subdirectory, if created).

5. Select Standard Migration.

6. Select the proper network operating system version currently on the server.

7. Select the destination network operating system version.

8. Choose the directory where the migration may process files (from the subdirectory, if created).

9. Press the Down Arrow key.

10. Press the Enter key and select the server to upgrade.

11. Press the Enter key and select the volume to upgrade.

12. Press the Enter key and select the same server name.

13. Press the Enter key and select the same volume.

14. Press the Esc key when done.

15. Select Random Passwords or assign No Passwords.

16. Select Start Migration.

17. View Migration Reports.

18. Exit.

## Migration Procedure: Over-the-Wire Migration STD

1. Go to a workstation attached to the network.

2. Go to DOS.

3. Insert the migration diskette in drive. (Note: This procedure is much faster if you copy the program disk to an empty subdirectory and run it from there.)

4. Run MIGRATE.EXE (from the subdirectory, if created).

5. Select Standard Migration.

6. Select the proper network operating system version currently on the server to upgrade.

7. Select the destination network operating system version.

8. Choose the directory where migrate may manipulate files (from the subdirectory, if created).

9. Press the Down Arrow key when completed.

10. Press the Enter key for a list of servers.

11. Select the server.

12. Press the Enter key and select the volume (must be a system volume--one that the server runs from).

13. Select the destination server--this is different from the original server.

14. Select the destination volume.

15. Press the Esc key when done.

16. Select Random or No Passwords.

17. Select Start Migration.

18. Select View Migration Reports; view for errors.

19. Select Exit.

Copyright 1995. Charles River Media. All Rights Reserved.

++++++++++

# GroupWise



## CD HELPdesk Series: Novell Products

Click on any icon for more information

Q+A    PROCEDURE LIST    REQUIRED

VENDOR LIST

## GroupWise Q & A

8204 Error Message with Sufficient Disk Space

ADMIN and VLMs

Alternate Logins

Appointments Vanishing

Automatically Adding Signatures

Creating Proxy for User on Another Post Office

Database Corruption

Difference between Delivery Modes

Difference Between DOS, OS/2, and NLM Versions of Gateways and Message Servers

Documenting the Links

Error C03E--Found Duplicate Key

Error Message after Upgrade to v4.1a

Error Message Viewing GIF File Attached to a Message

Fax Gateway Using E-mail Name Instead of Full Name

Gateway Only Uses Login ID, Not Full Name

Getting Current Information on GroupWise

GroupWise Async Gateway and Modems

Intel SatisFAXtion Modem Won't Insert User ID

Message Undeliverable to a GroupWise Group

MHS Duplicate Messages

Migrating Users to New Server and Retaining Existing Mail

# GroupWise Q & A: Error Message after Upgrade to v4.1a

**Since upgrading the GroupWise client to v4.1a, I receive an error message: "Network ID can't be found." Everything worked fine until the upgrade. Did something go wrong? How do I fix it?**

The GroupWise v4.1a client recognizes NetWare Directory Services (NDS), and hence, has a problem using the network ID you specified for the user. The only option is to edit the network ID in AD.EXE to include the full context for the user. The network ID should look like JSMITH.ACCT (the actual ID will be somewhat different, depending on your NDS tree organization and the position of the user in that tree).

# GroupWise Q & A: GroupWise Async Gateway and Modems

**I am getting ready to install the GroupWise Async Gateway. Is there a problem with having different modems on the gateway and on the remote client?**

If you have different brands of modems at each end of the connection, there is the potential for synchronization problems to occur when the modems are trying to negotiate the speed to talk at. If you have the same brand and model modem on each end of the connection, that will give you only one type of problem to contend with. Try to keep things as identical as possible.

# GroupWise Q & A: Error C03E--Found Duplicate Key

**When I try to send a message in GroupWise, I get this message: "C03E--Found duplicate key for unique index." How can I fix the problem?**

Run the GroupWise ADMIN program with the REBUILD option: AD /REBUILD. This will rebuild the GroupWise databases. If the problem persists, highlight the post office name in Admin and try repairing or rebuilding at the post office level.

# GroupWise Q & A: Nicknames and Undeliverable Mail

**I have a user that needs to receive mail addressed to INFO@REFERENCE.NET. The user's name is JSMITH. I put a nickname in AD for the user, but any mail sent to INFO is returned as undeliverable. What is wrong and how do I fix it?**

The shipping version of the GroupWise SMTP Gateway doesn't support nicknames for receiving mail. Download the latest update to the GroupWise SMTP Gateway from NetWire to fix this problem. Another option is to create a mailbox called INFO and create a rule to forward mail to the user.

# GroupWise Q & A: SMTP Gateway Lockup and LAN Workplace

**Intermittently our GroupWise SMTP Gateway locks up. Most of the time no error message is displayed, but the screen saver freezes. Once in a while, a TCP/IP panic message is displayed on the screen. We are using LAN Workplace. What can we do to fix this?**

Make sure you have the latest version and any applicable patches to LAN Workplace running on the workstation (this will make sure you have the latest TCP/IP protocol stack present on the workstation). It would also be a good idea to make sure the latest releases of LSL.COM, NETX.EXE, and the latest LAN drivers are installed on the workstation. Also, obtain the latest update to the GroupWise SMTP Gateway from NetWire. If the problem persists, try a different network adapter and possibly a different machine as the gateway.

## GroupWise Q & A: Alternate Logins

**Occasionally, users in GroupWise need to read and reply to other users' e-mail using the e-mail address of the user whose e-mail they are reading. Proxy doesn't seem to work. Is there another option?**

The /@-u switch should make this easier for you. /@-u allows you to read other users' e-mail without having to log in as that user. You will only need the GroupWise password for the user whose e-mail you need to work with.

# GroupWise Q & A: Appointments Vanishing

**I have a user whose appointments sent to him by other users vanish, even if the appointment is accepted. How do I fix this?**

Check the Mail/Phone option under the Preferences submenu and look at the Expiration option. Appointments that are mailed to users follow this expiration period, as do phone and e-mail messages. To eliminate this, set the post office default expiration to NONE. Users can still expire individual messages by entering a date in the Send Option submenu when they create messages.

## GroupWise Q & A: Documenting the Links

**I am trying to document our GroupWise installation. The configuration report doesn't yield any information on the links to other post offices or domains. How can I get these to display on the report?**

The report provides only basic information about a GroupWise setup. The only way to get this information is to do a print screen of the information from AD.EXE.

## GroupWise Q & A: Admin and VLMs

**When I am using GroupWise Admin (AD.EXE), I get a message that I am unable to transfer control when selecting a gateway-specific configuration option or when AD needs to shell out to transfer control to another subprogram. I notice this most often when I am using the Virtual Loadable Modules (VLMs) and haven't had it occur when I use NETX. Am I doing something wrong? Would upgrading to the latest VLMs help?**

Even if you are using the latest VLMs, you would still see the problem. The workaround for the time being (until Novell fixes the VLM compatibility issue) is to invoke AD.EXE as follows: AD /D=C:\. This option will change the manner in which AD.EXE handles its temporary files. The option redirects the temporary files to the root of the C drive.

## GroupWise Q & A: MHS Duplicate Messages

**Recently, our GroupWise DOS MHS Gateway began to send error messages that duplicate message IDs exist. Several thousand of these messages are received per hour. The user with this message ID also receives an equivalent number of messages. How do we fix this?**

Log in as the user created for the MHS gateway and change directories to the MHS\MAIL\GATES\gateway_name\OUT directory. Issue the RIGHTS command. This login ID should have Erase and Modify rights that allow the GroupWise MHS Gateway to delete a message when it has delivered it so that it won't try to redeliver the message the next time the gateway polls for incoming traffic.

## GroupWise Q & A: Receiving Current Information

**How can I stay up-to-date on the latest information about GroupWise?**

You have several options. Novell has a forum on CompuServe you can reach by issuing the GO GROUPWISE command at the CIS prompt. Another option is to send a message to Public@Novell.com via the Internet or Public@Novell via Novell's Message Handling Service (MHS) with the message body GET 1. Doing this will return a complete list of GroupWise documents, including technical sheets and installation experts (documentation that details the installation process).

# GroupWise Q & A: Retrieving GroupWise Files Remotely

**After installing the GroupWise Remote 4.1a client on a laptop computer, I asked it to download my messages. After several attempts, two messages still won't download. What am I doing wrong?**

Under the Remote menu on the laptop, look at the Send/Retrieve submenu and verify the size limitation setting for file transfers. The default is 30 kilobytes (KB) or less. Setting this option to download regardless of file size should fix the problem.

## GroupWise Q & A: Database Corruption

**We are experiencing problems with corrupt GroupWise databases on the server. Is there a way to minimize the potential for corruption until we can identify the cause of the corruption?**

Yes. Implement the /NOCACHE option in your STARTUP.NS file in the SYS:SYSTEM directory.

## GroupWise Q & A: Resource and GroupWise Nicknames

**The individuals at our company responsible for managing the declared GroupWise resources change on a periodic basis. Is there any way we can use nicknames to ease the transition when individuals change roles?**

Managing resources requires a user ID and won't support a nickname. The best way around this is to create a USER ID in GroupWise for the person that will manage the resources, and set up a rule to forward all incoming mail to that person's login name.

# GroupWise Q & A: Difference between Delivery Modes

**What is the difference between App Threshold and Server Always message delivery modes?**

Server Always mode means that all messages are delivered by the message server. This is also the most secure mode, since a minimum of rights have to be granted to the post office directory in which messages will be handled. Server Always mode requires the GroupWise message server, which can be based on either DOS, NetWare Loadable Modules (NLMs), or UNIX. App Threshold indicates the number of message recipients delivered to the client sending the message. Although App Threshold can mean potentially faster delivery of messages, remember that not only are messages being delivered by the client sending the messages, but as each message is delivered, the recipient's list of "rules or instructions for handling messages must be checked. For a Pentium or high-end 486 CPU, this type of delay probably won't be noticeable but for a 386 or lesser powered desktop machine, this could seem like an eternity. The App Threshold message delivery level can be set on a post office or individual basis. This allows you to tailor the client-based delivery limits according to the type of desktop assigned to a given user.

## GroupWise Q & A: Difference Between DOS, OS/2, and NLM Versions of Gateways and Message Servers

**What type of performance difference can I expect between the DOS, OS/2, and NetWare Loadable Module (NLM) versions of the gateways and message servers?**

The DOS platform software is somewhat less expensive to implement. The hidden costs are that each DOS gateway or message server requires a licensed connection on the server it is servicing, and under heavy load conditions, messages may take longer to be delivered. Depending on the number of gateways and message servers you intend to implement, the number of PCs required for implementation could be significant. The advantages of the NLM platform are that you are using a 32-bit version of the 16-bit DOS-equivalent, no licensed connection is required on the server it is running on, and you should have a 9-to-1 performance advantage over the DOS product. The NetWare Loadable Modules (NLMs) offer several tuning options for optimal message handling. OS/2 versions of the gateways or message servers provide about a 5-to-1 performance advantage over their DOS counterparts.

# GroupWise Q & A: Message Undeliverable to a GroupWise Group



**I am trying to send a message through Global MHS to the GroupWise MHS Gateway but I can't get a message delivered to a GroupWise Group. The message gets returned as undeliverable. What is the problem?**



There is a minor bug in the current version of the MHS gateway (both DOS and NLM) that prevents the MHS gateway from being able to resolve a MHS message group (also known as a DLIST or distribution list) and a GroupWise message group. Since Novell is moving in the direction of a Collaborative Message Server in late 1995, it is unknown whether this problem will be resolved. There are two workarounds for the problem. The first is to create a user in GroupWise with the Group's name and set up a rule in that mailbox to forward all mail to the respective users. This can be somewhat of a maintenance headache. An easier option is to set up a distribution list on the Global MHS server in which the group members are listed with their MHS addresses through the MHS gateway (i.e., user@mhsgate.groupwise). This puts more of the message delivery burden on the Global MHS box. There is one down side to this option. Any time a message is replied to, the recipient of the reply will be the error mailbox address for the distribution list that sent the message to the GroupWise user if an address is specified for the error conditions pertaining to that DLIST.

# GroupWise Q & A: Intel SatisFAXtion Modem Won't Insert User ID

**I just converted from using an Intel SatisFAXtion modem in a standalone PC to using it as part of the GroupWise Fax/Print Gateway. On the header line at the top of each fax page that is sent out, it inserts the information I used to use on the PC, but it won't insert the user ID of the individual who is faxing the message. How can I change this?**

The From part of the header line you mention is controlled by the Intel SatisFAXtion modem configuration program. GroupWise isn't able to change the information. A possible solution is to change the information in the fax modem setup software (supplied by Intel) to something like GroupWise Fax Gateway or your company's name. By editing the cover sheet used in the outbound fax, you can become very creative in conveying your company's name or other important information.

# GroupWise Q & A: Gateway Only Uses Login ID, Not Full Name

**On the cover pages the fax gateway puts at the front of each outbound fax, it only uses the login ID of the fax sender and not his or her full name. How can I change this?**

Using the GroupWise ADMIN program (AD.EXE), check each user's record to make sure that the first and last name fields are filled in. When this is done, the information in these two fields will replace the login ID you currently see on the cover page.

## GroupWise Q & A: Fax Gateway Using E-mail Name Instead of Full Name

**The cover sheet from the fax gateway is putting the sender's e-mail name instead of his or her full name on the FROM: line. What is causing this?**

For any users that you want to use the fax gateway, it is a good idea to verify their records in the GroupWise ADMIN program AD.EXE to make sure they have entries for first and last name. Once this information is in place, the fax cover page should be correct. It is also a good idea to verify that there isn't a conflicting gateway alias entry in the user entry in the GroupWise database or a default alias in the fax gateway entry.

## GroupWise Q & A: Using NetWare Connect Instead of Asynch Gateway

**Occasionally we have the need for users to call in to get their mail. The demand so far doesn't justify buying the Async Gateway. Can we use NetWare Connect to accomplish this same task?**

It is possible to do this. You will need to configure NetWare Connect for RNS (Remote Node Service) and equip your portable PCs with the appropriate files and drivers. For the best performance, create a batch file that attaches to the server and maps a drive to the volume containing the GroupWise post office. Have a copy of the ATTACH and MAP commands on the user's PC instead of loading them across the dial-in connection. Configure the GroupWise remote client to use a drive letter pointing to the location of the post office your user needs to use. When you run the GroupWise remote client, it should be able to find the post office and exchange messages.

# GroupWise Q & A: Getting Current Information on GroupWise



**Is there a way that I can stay in touch with developments and problems with GroupWise without having use the GroupWise forum on CompuServe?**



Novell has a World Wide Web server that has a section on GroupWise. Its address is HTTP://WWW.NOVELL.COM/ServSupp/groupware. You can also subscribe to the WPNGW listserver at tribble.edu.uvsc. To subscribe, send a message tolistproc@tribble.edu.uusc with a message line that says subscribe WPOFFICE first_name last_name.

## GroupWise Q & A: Windows 95 Use with GroupWise Windows Client

**Can I get the current GroupWise Windows client to work under Windows 95 until a native client for 95 is released?**

Add the following to the command line for the GroupWise client: /@U-login ID. Replace the login ID value with the name you logged into NetWare with and you should be able to send or receive mail.

## GroupWise Q & A: Transferring the Address Book to a Remote Client

**After installing GroupWise remote on a PC, I connected via the network successfully. Several attempts to transfer the address book have not been successful. The request is delivered but nothing happens after that. Why isn't the request for the address book being processed?**

Make sure the user ID you are logging into the network with has modify rights to the WPCSIN/1 directory. This is a documented problem that is discussed further in the README.AD file found in the DOMAIN directory.

## GroupWise Q & A: User Forgot Password; Having Trouble Changing

**A user forgot his password, so I went into AD.EXE to reset it. AD reports that no password has been set for the client in question. What's wrong?**

This message in AD indicates that no password has been set for the user in the ADMIN program. It doesn't mean that there wasn't a password set by the client itself. You can still clear the password for the client and either set a new password for him or allow him to set his own password. If you have a default password set for all clients when they are created, this password is overridden when the client sets his own password.

## GroupWise Q & A: Error Message Viewing GIF File Attached to a Message

**Someone recently set a GIF file as an attachment to a message. When I try to view this file, I get an error message that a viewer is not available. How can I view this graphics file?**

Using AD, you can fix this. Make sure you are at the post office level for your post office. Choose Actions and then GroupWise 4.1 Options. Next select Attachment & Editor Association and then choose Associate by Extension. You have now built the relationship between the GIF file and the viewer you want to use. Remember you will have to have the viewer in a path where it is accessible. If you have more than one post office and need this change to take effect for everyone, perform this addition at the domain instead of the post office level.

# GroupWise Q & A: Trouble Automatically Printing All Faxes

**We have just started using the Fax/Print Gateway to handle incoming faxes. I set up a rule in the postmaster's inbox to automatically print all faxes. The cover page prints fine, but the fax itself comes out as several pages of random garbage. What am I doing wrong?**

Version 4.1 of the Fax/Print gateway has a problem printing the .DCX files that contain the actual fax. Novell development has been made aware of the problem and is working on fixing it.

## GroupWise Q & A: Migrating Users to a New Server and Retaining Existing Mail

**We will be moving some of our users to a new server shortly. Is it possible to migrate them into a post office running on that server and still retain their existing mail?**

As long as neither of the post offices resides in an external domain, you can edit the user's record in AD and change the post office field. The move-in user information and mail is handled by the message server. Depending on the amount of mail the user has, the move between post offices can take between 5 to 15 minutes on average.

# GroupWise Q & A: 8204 Error Message with Sufficient Disk Space

**I am starting to get 8204 error messages in GroupWise. The manual indicates these are "disk full" warnings, but I have plenty of disk space. What do I need to look for?**

This message can indicate that the user doesn't have sufficient rights to save what he or she is working on. It is more likely that some of the files users are trying to save may not have owners. This means that some of the user or message databases will not have an owner. They show up in FILER as N/A or No Owner, depending on the version of NetWare you are using. Using the Change Directory (CD) option, switch to the post office directory and issue the following command at the DOS prompt: NDIR /OW LE * /SUB. This will search for files that don't have an owner and list them on the screen. You can direct this output to a file by using the DOS redirecting (FILE.TXT) option, placing this at the end of the NDIR command line. Using the list and locations of files, FILER can be used to assign an owner to these orphaned files.

# GroupWise Q & A: Restoring User and Mail after Deletion

**In doing some housekeeping on our GroupWise installation, I accidentally deleted a user. Is there any way I can restore the user and all of his mail?**

It will help if you have a listing of the FIDs (File IDs) for each GroupWise user. If you don't, you may still be able to retrieve the user and the mail. Go into the directory where the USER.DB files are kept and use the Salvage program to see what deleted files are present. Compare this to the files existing in the directory. By process of elimination, you should be able to find the matching .DB file for the user you are trying to fix. The next step involves creating an ASCII import file (consult the GroupWise manuals for details on how to do this). Specify the FID for the user that matches the DB file that you have recovered. In GroupWise ADMIN (AD.EXE), you can then import the user using the ASCII template and he should be able to see all his mail. It would be a good idea to run an OFCHECK against the post office and on the user to make sure that everything has been recovered.

# GroupWise Q & A: Automatically Adding Signatures

**Is there any way I can automatically add a signature to the messages I send out?**

There are two ways you can do this. The first involves creating a macro that can add the desired information before you send the message. An easier solution is to have your administrator purchase the GroupWise Enhancement Pack. One of the features included in this is an option that will either automatically add a signature when sending a message or prompt you before adding the signature when sending.

# GroupWise Q & A: Creating Proxy for User on Another Post Office

**Our post offices are set up according to job categories. I haven't been able to allow an administrative assistant who is on one post office to proxy her manager, who is on another post office. Am I doing something wrong?**

Proxy only works on objects within the same post office. Given your configuration, the manager can only allow someone who is on the same post office proxy to his e-mail and scheduling information.

# GroupWise Procedure List

[Installing GroupWise for Single Domain, Single Post Office Installation](#)

[Installing Updated or New GroupWise Client After GroupWise has Been Installed](#)

## GroupWise Procedure: Installing GroupWise for Single Domain, Single Post Office Installation

1. Fill out the Setup 4 Worksheet found in the Installation Guide.

2. Log into the server as Supervisor or supervisor-equivalent.

3. Insert ADMIN disk 1 into the diskette drive.

4. Change to the diskette drive, type INSTALL and press the Enter key.

5. Press Y to continue the installation.

6. Select INSTALL TO: line and press the Enter key.

7. Type the drive letter and domain directory name (the second box on the setup worksheet) and press the Enter key.

8. Press Y to continue if prompted (Create Directory Install question).

9. Press the Enter key on Files to Install option.

10. Select Administration and press the Enter key (this installs the GroupWise ADMIN program).

11. Select Office 3.1 compatibility and press the Enter key only if you are using WordPerfect Office 3.1 (an earlier version of GroupWise).

12. Select the Windows client and press the Enter key if you will be installing the Windows GroupWise client.

13. Select the DOS client and press the Enter key if you will be installing the DOS GroupWise client.

14. Press the F10 key when you are finished selecting the components you want to install.

15. Select Start Installation and press the Enter key.

16. Press Y to continue the installation.

17. Insert additional diskettes as prompted.

18. Press the Enter key to continue (if prompted).

19. Press N if you do not want to display the README file.

20. Press any key to proceed with the GroupWise-assisted setup.

21. Select Continue and press the Enter key at the welcome screen.

22. Select continue and press the Enter key at the mouse setup screen.

23. Enter the domain name from the Setup Worksheet and press the Enter key.

24. Select OK and press the Enter key.

25. Select the correct time zone and press the Enter key

26. Press Y? if your time zone uses daylight savings time; press N if it doesn't use daylight savings time; confirm daylight savings time information, and press the Enter key.

27. Verify information in the Language and Network box; press the Enter key.

28. Press the Enter key when the Reminder box is displayed.

29. Press the Enter key when the Progress Report box is displayed.

30. Enter the post office name and press the Enter key.

31. Press the Enter key on OK.

32. Verify the drive letter and post office directory and press the Enter key.

33. Press the Enter key.

34. Make sure the appropriate clients are selected when the copy software to post office directory box is displayed.

35. Press the Enter key.

36. Press the Enter key when the Reminder box is displayed.

37. Press the Enter key when the Progress Report box is displayed.

38. Enter a user's existing network login name or create a new one (used for testing GroupWise).

39. Press the Enter key.

40. Press the Enter key.

41. Select Add User and press the Enter key.

42. Repeat Step 39.

43. Press the Enter key.

44. Press the Enter key.

45. Press C to continue.

46. Press the Enter key.

47. Press D for done.

48. In syscon, create a group called GroupWise.

49. Assign trustee directory rights to this group based on the standard configuration column on Page 202 of the *GroupWise Administration Guide*.

50. Finish setting up GroupWise clients as described in the GroupWise Administration Guide.

## GroupWise Procedure: Installing Updated or New GroupWise Client After GroupWise has Been Installed

1. Insert the Client 1 diskette into the diskette drive.

2. Change to the diskette drive, type INSTALL and press the Enter key.

3. Select Install to Line and press the Enter key.

4. Enter the drive letter and domain directory name and press the Enter key.

5. Select Start Installation and press the Enter key.

6. Press Y to continue with installation.

7. Insert additional diskettes as required.

8. Press any key when you receive a message that the client has been installed.

9. Press N to bypass the README file.

10. Press any key to exit the INSTALL program.

11. Change to the GroupWise domain directory.

12. Type AD and press the Enter key.

13. Press the Tab key to move the highlighter bar to the System window.

14. Select the post office you want to copy the new or updated client program to.

15. Press ALT-T for the Tools menu.

16. Select Software Management and press the Enter key.

17. Select the client software to be copied and press the Enter key.

18. Client files will now be copied to the selected post office.

19. Press the Enter key.

20. Press F7 to exit GroupWise administration.

21. Press Y to confirm.

## GroupWise Required

**Admin requirements:**

- 486 or better CPU

- 640KB RAM

- 40MB of disk space

**DOS client requirements:**

- 386/25 or better CPU

- DOS 5.0 or later

- 500KB RAM

- 4MB extended or expanded RAM

- 6MB disk space

**Windows client requirements:**

- 386/25 or better CPU

- Windows 3.1

- 4MB RAM (more is recommended)

- 17MB disk space

**Message Server NLM requirements:**

- 2MB disk space

- CLIB.NLM 3.12F or later

- 8MB additional RAM

- NetWare v3.x or 4.x

- 486 or better CPU recommended

## GroupWise Utilities and Demos

Common Knowledge (Free 30-Day Trial) by On Technology Corp.

DaVinci eMAIL (Free 30-Day Trial) by On Technology

Meeting Maker XP Cross Platform Group Scheduler (Free 30-Day Trial) by On Technology Corp.

Notework Electronic Mail (Free 30-Day Trial) by On Technology Corp.

## GroupWise Utility: DaVinci eMAIL (Free 30-Day Trial) by On Technology

DaVinci eMAIL includes NetWare Directory Services (NDS) support as well as NetWare MHS-based electronic mail capability for DOS, Windows and Macintosh environments.

Installation:

1. Log in as "ADMIN on a 386 or higher PC-compatible workstation with at least 2 megabytes (MB) of RAM and DOS 3.3 or higher.

If you do not have an ADMIN user name with supervisory rights on the network, you can use any user name that has supervisor equivalence.

2. Run Windows.

3. Select RUN from the File menu.

4. Click on the Browse button to select the drive that contains the subdirectory containing the files you copied from the CD-ROM, then select SETUP.EXE and click on OK.

    Example: C:\DAVINCI\SETUPWIN.EXE

5. Click on the OK button.

6. Read the introduction at the bottom of the Setup screen, then click on the Install DaVinci eMAIL button.

7. Click on the Browse button if you wish to change the eMAIL installation.

Specify a different location for the new eMAIL installation, including the name of the directory for eMAIL itself.

    Example: M:\PUBLIC\DAVINCI

Note: Make sure the path you specify is accessible to all your users; all users should have a drive mapped to that SERVER/VOLUME. Use a drive letter and a complete path syntax for the installation, not server/volume syntax. The Browse feature will help you avoid typos and incorrect syntax.

8. Click on the OK button.

The SETUP program will display the Disk Space Required to install the eMAIL program and its files.

9. Click on the Install button to continue.

Follow the instructions on the screen while the SETUP program installs eMAIL.

After SETUP finishes, you will be returned to the Windows Program Manager for a few seconds as SETUP closes and ADMIN loads.

## GroupWise Utility: Meeting Maker XP Cross Platform Group Scheduler (Free 30-Day Trial) by On Technology

Meeting Maker XP, group scheduling software, includes LAN and Internet support, as well as other e-mail integration features.

To install this software, copy the directory D:\PROGRAMS\MEETING to your hard disk. Then run the SETUP program from the Windows Program Manager File Run command line. If your hard drive is designated as drive C, type C:\MEETING\setup.exe and choose OK.

## GroupWise Utility: Notework Electronic Mail (Free 30-Day Trial) by On Technology

Notework Electronic Mail includes support for Macintosh, Windows NT, DOS, and Windows 3.1 clients.

To install this software, copy the directory D:\PROGRAMS\NOTEWORK to your hard disk. Then run the INSTALL.BAT file from the Windows Program Manager File Run command line. If your hard drive is designated as drive C, type C:\ notework\install.bat and choose OK.

## GroupWise Utility: Common Knowledge (Free 30-Day Trial) by On Technology

Common Knowledge, a collaborative groupware product for sharing information and documents, allows users to create, access, edit, distribute, and share information over a network while providing a structure for managing and tracking the input of workgroup participants.

To install this software, copy the directory D:\PROGRAMS\COMMON to your hard disk. Then run the SETUP program from the Windows Program Manager File Run command line. If your hard drive is designated as drive C, type C:\common\setup.exe and choose OK.

**PerfectOffice Suite**



**CD HELPdesk Series: Novell Products**

Click on any icon for more information

## PerfectOffice Suite Q & A

[After Custom Installation Can't Find Spell Checker, Etc.](#)

[After Installation DAD Bar Button Points to GroupWise Demo](#)

[Error After Installation: "Third-party error handler...](#)

[Error after Installation: "WPIN Error--Unable to Start Print Process](#)

[Installation of Additional Fonts](#)

[Installing PerfectOffice from The Server](#)

[QuickLaunch and FastLoad Contention for Soundblaster](#)

[Suppressing DAD Screen Logo](#)

[Users Move from Computer to Computer; Want to Retain Correct DDT File](#)

[Using Spell Checker with Non-Novell Programs](#)

# PerfectOffice Q & A: Installing PerfectOffice from The Server

**Even though all users will have PerfectOffice installed on their local hard drives, is there a way I can use the server to install PerfectOffice to simplify the process and reduce the time spent?**

Create an installation directory for PerfectOffice on the server. With this directory, you will be able to perform both server and workstation installations. Check the README.NET that ships with PerfectOffice for further information.

## PerfectOffice Q & A: QuickLaunch and FastLoad Contention for Soundblaster

**I am using the OS/2 Integration Toolkit to run PerfectOffice under IBM's OS/2 Warp. When I have both QuickLaunch (from the OS/2 Integration Toolkit) and FastLoad (from OS/2 Warp) active, there seems to be contention for which one will control the SoundBlaster adapter I have installed. Can I get FastLoad and QuickLaunch to work together?**

Ideally, you should use either QuickLaunch or FastLoad, not both at the same time. One workaround for your situation is to configure QuickLaunch to tell it the Audio Adapter is optional or not available.

## PerfectOffice Q & A: Error after Installation: "Third-Party Error Handler..."



**Since installing GroupWise on a LAN that already had PerfectOffice installed, users now get the error "Third-party error handler error--unable to load c:\office\shared\wpc20\ofenus.dll." Did I do something wrong during the GroupWise installation?**



Using BIFED20.EXE (found in your WPC20 directory), edit the users' private .BIF files. Look for the folder labeled Third-Party Handler and delete it. If you can't find BIFED20 or the folder in the .BIF file, delete the users' private .BIF files and let WordPerfect recreate them when it starts the next time.

## PerfectOffice Q & A: Error after Installation: "WPIN Error--Unable to Start Print Process"



**After installing GroupWise, one of the users began receiving a message in WordPerfect 6.1: "WPIN error--Unable to start print process." How do I fix this error?**



Try logging in as a different user. This will tell you if the problem is rights-related. Verify that the user has a SET TEMP command in his or her AUTOEXEC.BAT file and that it points to a valid directory. Make sure the directory is empty. If it isn't, delete the files you find there. You can also try deleting or renaming the STANDART.WPT file.

# PerfectOffice Q & A: Installation of Additional Fonts



**I have additional fonts I would like to make available for the PerfectOffice users on our LAN. Should I install these on the server or on each individual workstation?**



The location of the fonts depends on how many users will need them. If only one or two will use them, it may be easier to install them on the individual workstations. If most of the users will need them, install them on the server and let those who need them get to them.

# PerfectOffice Q & A: Suppressing DAD Screen Logo

**How can the screen logo for DAD be suppressed to speed up the startup cycle?**

There isn't a way to do this currently. Novell has indicated that it might be added as an enhancement in the next release of the product.

## PerfectOffice Q & A: Users Move from Computer to Computer; Want to Retain Correct DDT File

**The users on our network move from computer to computer during the day. How can we make sure they are using the correct DDT file (containing the DAD menus) when they log in at a certain workstation?**

There is no way you can specify a location for a user's DDT file. The only option available is to use a batch file to copy the DDT for a specific user to the WINDOWS directory on his or her computer. Something to consider would be to run WINDOWS from the server, which would make this batch file scenario a moot point.

## PerfectOffice Q & A: After Custom Installation Can't Find Spell Checker, Etc.

**I installed PerfectOffice's WordPerfect for Windows 6.1 on my laptop with a minimal installation. Now, WordPerfect for Windows says it can not find the spell checker, grammar checker, or thesaurus. How can I install these three items?**

You can use the custom installation option of PerfectOffice to accomplish this. Make sure you select the PerfectFit Components option (you may need to click on the scroll bar in the selection box to see this option). Click on Files and select the items you need to install.

## PerfectOffice Q & A: After Installation DAD Bar Button Points to GroupWise Demo

**We have just installed GroupWise on our server. The button on the DAD bar still points to the GroupWise demo. Shouldn't this have been changed during the GroupWise installation?**

No. You will need to manually change the envelope icon on the DAD bar to point to the location of the GroupWise software. Hopefully Novell will offer this automatic change feature in the next version of the software.

## PerfectOffice Q & A: Using Spell Checker with Non-Novell Programs

**I am a recent convert to PerfectOffice. Is there a way I can use Spell Checker outside of PerfectOffice and possibly with other non-Novell programs?**

Spell Checker can be used outside of PerfectOffice but only to look up individual words. At this time, there are no options to integrate it with non-Novell programs.

## PerfectOffice Suite Procedure List

[Installing Nodal Copy of PerfectOffice from Server Copy](#)

[Installing PerfectOffice from CD-ROM to Server](#)

## PerfectOffice Procedure: Installing PerfectOffice from CD-ROM to Server

1. Insert the PerfectOffice CD into the CD-ROM drive (workstation or server).

2. If the CD-ROM drive is on the server, mount the CD and map a drive letter to the CD volume.

3. At the workstation, type WIN and press the Enter key.

4. Press ALT F, Run.

5. Enter the drive letter for the PerfectOffice CD and add :\POWIN30\SETUP.

6. Press the Enter key.

7. Select Install and press the Enter key.

8. Select Network and press the Enter key.

9. If a previously installed application dialog box is presented, record the information displayed, select Continue, and press the Enter key.

10. Change the drive letter for each of the applications you plan to install from the C: drive to the drive letter mapped to the volume you want to install to.

11. Select Start Installation and press the Enter key.

12. Answer Y to each create a directory dialog that is displayed to continue.

13. If each user has his or her own WIN.COM file, select the user's Windows directory; if not select the shared directory.

14. Select Y on Network Model question if you want users to be able to set their own default file location preferences.

15. Fill in the drive and path to the networked copy of Windows if any of the users are also able to run a local copy of Windows.

16. Select OK and press the Enter key.

17. Press N to avoid viewing the README files.

18. Press OK when the Reminder dialog box appears on screen.

19. Press OK when the Install Complete screen appears.

20. In SYSCON, create a group for PerfectOffice.

21. Assign the appropriate trustee directory rights to the group.

22. Assign users to the group.

## PerfectOffice Procedure: Installing Nodal Copy of PerfectOffice from Server Copy

1. Assign the user to the PerfectOffice group.

2. Log in as the user.

3. Map a drive letter to PerfectOffice path.

4. Start Windows.

5. Press ALT-F, Run.

6. Type the drive letter to where PerfectOffice is stored, followed by :\OFFICE\SHARED\SETUP.EXE and press the Enter key.

7. Select Install and press the Enter key.

8. Select Continue and press the Enter key.

9. Select Applications to Install from the Workstation Install dialog box.

10. Select OK and press the Enter key.

11. Select the drive letter for work files.

12. Select OK and press the Enter key.

13. Select OK and press the Enter key when the PerfectOffice Install Complete screen appears.

## PerfectOffice Suite Required

**Client requirements:**

- Microsoft Windows 3.1

- 386 or better CPU

- 8MB RAM

- VGA monitor

- 68-138MB disk space required depending on selected configuration

# Novell DOS 7

**CD HELPdesk Series: Novell Products**

Click on any icon for more information

Q+A

PROCEDURE LIST

REQUIRED

VENDOR LIST

## Novell DOS 7 Q & A

[After Hard Drive Installation, Operation Is Slow](#)

[Compatibility with OS/2 Warp](#)

[Configuring a 4GB Drive](#)

[EMM386 Error with Black Screen and Memory Conflict](#)

[GPFs after Upgrading](#)

[NWCDEX Instructions](#)

[NWCDEX vs. MSCDEX](#)

[Stacker Errors](#)

[Task Swapping Necessitates a Cold Boot](#)

[Workstation Hangs after Loading DOS](#)

## Novell DOS 7 Q & A: Stacker Errors

**Recently, I decided to unstack my C drive. Before starting, I backed it up on tape. While running UNSTACK, I received a message that SDEFRAG would also need to be run. After running SDEFRAG and then UNSTACK again, I received a FATAL ERROR message 95 percent of the way through the unstacking process. Now I can't boot from the drive. Is there any way I can fix this?**

Try booting the workstation from a disk formatted as a system disk. Using the ATTRIB command as follows, you should be able to finish unstacking the drive: ATTRIB-RSH C:\STACKVOL.DSK. The syntax following the ATTRIB command removes the read-only, system, and hidden attributes from the "hidden file that constitutes the compressed volume. Depending on how much of the volume was originally compressed, the name to use after ATTRIB may be different from STACKVOL.DSK. You should also apply D70U13.EXE from NetWire to fix some problems in Novell DOS 7 before continuing to use it.

# Novell DOS 7 Q & A: EMM386 Error with Black Screen and Memory Conflict

**I recently started having a problem with EMM386.EXE going to a black screen and reporting a memory conflict. Is there any way to fix the problem?**

Download D70U13.EXE (assuming you are using the English version of Novell DOS). In this update are two files that interact directly with the hardware in your computer--IBMBIO.COM and IBMDOS.COM. These files are marked Hidden, System, Read-only (HSR) on the boot sector of your hard drive and disk. Updating these two files has fixed a number of reported problems.

# Novell DOS 7 Q & A: After Hard Drive Installation, Operation Is Slow



**I have just installed a new hard drive in my workstation. It seems to be running more slowly than I expected. The problem is very noticeable when running some of the Windows applications I have. The hard drive manufacturer's technical support department thinks there could be a compatibility issue with Novell DOS 7. Could this be possible?**



Yes. The first thing to do is download and apply the latest DOS 7 patch (D70U13.EXE, assuming you are using the English version of Novell DOS). This will eliminate DOS as the problem. Another thing to look at is how much virtual memory you have configured for Windows to use. Depending on how many programs you are trying to run at the same time or how much memory they require, a permanent swap file of up to 20 megabytes (MB) may be required. Using SMARTDRV or a similar disk caching program may also help boost the performance of your hard drive.

# Novell DOS 7 Q & A: NWCDEX Instructions

**I am trying to use NWCDEX on my computer. The current configuration involves both a SoundBlaster-type adapter with a CD-ROM interface and an Adaptec SCSI controller. The manuals that come with Novell DOS 7 contain no information on how to use NWCDEX. Where can I find out how to properly use the command?**

There is a README.TXT file in the NWDOS directory on your hard drive that provides the information you are looking for. You can also find this information by entering NWCDEX /? at the DOS prompt and pressing the Enter key.

# Novell DOS 7 Q & A: Configuring a 4GB Drive

**I am trying to use a 4 gigabyte (GB) hard drive in my workstation. FDISK keeps forcing me to partition the hard drive into two 2GB drives. I want to have one drive designation. Is there any way to get FDISK to configure the drive as one instead of two drives?**

No. Unfortunately, this is a limitation of Novell DOS 7 that is required to keep it compatible with the other versions of DOS presently available. None of the other versions of DOS can exceed the 2GB barrier. It is probably better that you partition the drive into smaller partitions. If the partition table were to be damaged, it is less likely that you would loose the entire drive. Smaller partitions will also make it easier to back up the drive to most workstation-type tape drives without using multiple tapes.

# Novell DOS 7 Q & A: Task Swapping Necessitates a Cold Boot

**I am trying to use the task-swapping feature in Novell DOS 7. When I try to run an application I have written, the system usually hangs, requiring a cold boot. I don't have a problem when trying to use Windows task swapping instead of Novell DOS 7, but I don't want to have to use Novell DOS 7. How can I get this working?**

The first thing to do is download and apply the D70U13.EXE patch (assuming you have the English version of Novell DOS 7). Change the task-slicing setting in TASKMGR.INI, which is located in the NETWAREDOS directory.

# Novell DOS 7 Q & A: NWCDEX vs. MSCDEX

**I have just installed a CD-ROM drive on my workstation. The manual that came with the drive indicates that I must use MSCDEX.EXE in order to use the CD-ROM drive. I noticed that Novell DOS 7 has a NWCDEX.EXE command instead of MSCDEX.EXE. Which one should I use and why must I use one over another?**

MSCDEX and NWCDEX function as CD-ROM redirectors so DOS can access the device. MSCDEX is normally distributed by the drive manufacturer. An advantage NWCDEX has over most of the versions of MSCDEX is that it can be loaded into extended memory. Most variations of MSCDEX can only load into expanded memory.

# Novell DOS 7 Q & A: Workstation Hangs after Loading DOS

**When booting a PC, it hangs shortly after giving the "Loading DOS" message. This occurs with several different versions of DOS. What is causing the problem?**

Most likely the problem is hardware-related (i.e., a bad motherboard or plug-in adapter). The first thing to try is to remove all the adapters possible and see if the problem occurs. Next try stripping down the AUTOEXEC.BAT and CONFIG.SYS files to the bare minimum and try again. Verify that the CMOS settings are as standard as possible. Try new memory on the motherboard. If the problem persists, you probably have a bad motherboard.

# Novell DOS 7 Q & A: Compatibility with OS/2 Warp

**I am thinking about trying to run Novell DOS 7 and IBM's OS/2 Warp. Will they work together?**

You can use Novell DOS 7 in a Virtual DOS Mode (VDM) session in OS/2 Warp. The only requirement is that you have to create a disk image under OS/2 so it can "boot the version of DOS you want. If you want a dual-boot configuration in which you choose to boot to Novell DOS or OS/2, you will be pleasantly surprised by how well these two work together in that configuration. Novell DOS doesn't try to delete the other partitions from the hard drive or make the DOS partition the active one in FDISK when installing an update to Novell DOS. Novell DOS also has enhancements to the DOS commands that you won't find in MS-DOS.

# Novell DOS 7 Q & A: GPFs After Upgrading

**After upgrading my PC to Novell DOS 7, I began experiencing General Protection Faults (GPFs) in Windows when running several of the applications I use. This problem doesn't occur if I boot the PC under a version of DOS other than Novell DOS 7. Do you have any ideas about how to fix this?**

The first thing to do is apply the D70U13.EXE patch kit to your workstation. See if your application uses the DOS SHARE command. If it does, try loading SHARE with parameters such as /L:500 /F:5000. If that fixes the problem, you can try lowering the values until you see the problem occur, or you can just leave the SHARE parameters where they are now.

# Novell DOS 7 Procedure List

[Installation](#)

[Optimizing Memory Using Setup](#)

## Novell DOS 7 Procedure: Installation

1. Boot the PC.

2. Put the Novell DOS 7 disk in drive A.

3. Type INSTALL and press the Enter key.

4. Select Continue with Installation and press the Enter key.

5. Enter your name and press the Enter key.

6. Enter your company name (if applicable) and press the Enter key.

7. Enter the serial number of the product and press the Enter key.

8. Select Accept the Above and press the Enter key.

9. Select Continue with Installation and press the Enter key.

10. If you don't want to install Personal NetWare at this time, deselect the Networking System line.

11. Select Continue and press the Enter key.

12. Select Proceed with the Installation and press the Enter key.

13. After verifying your selections, select Start Installation and press the Enter key.

14. Insert additional disks as prompted.

15. Press OK to reboot when finished.

## Novell DOS 7 Procedure: Optimizing Memory Using Setup

1. At the DOS prompt, type SETUP and press the Enter key.

2. Press the Tab key to select the DOS System and Memory Management and press the Enter key

3. Press the Tab key to select Memory Manager and press the Enter key.

4. Press the Tab key to highlight the Configure button and press the Enter key.

5. Press the Tab key to select any of the options appearing on the screen and press the Space Bar to activate that item.

6. When you are finished, select Accept the Above and press the Enter key.

7. Select Exit this Screen and press the Enter key.

8. Press the Enter key.

9. Press the Enter key on Save Changes and Exit.

10. Press the Enter key.

11. Press the Enter key on Restart Operating System to have changes immediately take effect.

## Novell DOS 7 Requirements

- 8088 or better CPU

- 640KB for 8088 (more is recommended)

- 20MB of disk space

## Informs

**CD HELPdesk Series: Novell Products**

Click on any icon for more information

Q+A

PROCEDURE LIST

REQUIRED

VENDOR LIST

## Informs Q & A

[Assigning Icons to Forms](#)

[Data Entry into Form](#)

[GPF after Installing WordPerfect 6.1](#)

[Linking Paradox Graphics Fields to Informs Form](#)

[Maximum Number of Pages](#)

[ODBC Error with Microsoft Access 2.0](#)

[Same Field Name Must Be on Every Page](#)

[Sending Forms via GroupWise](#)

[Use of IF Statement](#)

# Informs Q & A: Linking Paradox Graphics Fields to Informs Form

**I am trying to link graphics fields that reside in a Paradox database to an Informs form I am building. What do I have to do to get these two applications working together?**

There is nothing you can do. Paradox graphics fields are stored in a separate file outside of the Paradox database and are only available to Paradox.

# Informs Q & A: ODBC Error with Microsoft Access 2.0

**I am trying to link a Microsoft Access 2.0 database with an Informs form. When I read the data from the Access database into the Informs form, I get an Open Database Connectivity (ODBC) error from Informs. Shouldn't I be able to make this type of connection?**

Maybe. Not all field types in Microsoft Access can be used with Informs. Informs automatically selects the first field type in the external database that is returned by the ODBC driver. If you have an option of choosing another field type in the ODBC link, that might be worth looking at.

# Informs Q & A: Same Field Name Must Be on Every Page

**I am working on a multi-page form. The problem I have run into is that the same field name must be present on several of the pages in the form. When I copy a field to a new page, the name of the field changes. Is there a way I can use the same name for the field on each page of the form?**

For Informs to properly track field names, each field name must be unique. There is a workaround you might try. The label for the field in question on Page 2 of the form can be the same as it was on Page 1. Labels are simply text areas on the form that don't have to be kept track of in the same way that fields are.

# Informs Q & A: Assigning Icons to Forms

**Is there any way I can assign a different icon to a form? We have some users who can make the association faster with an image than by having to read the text under the icons.**

Icons are a function of the Windows Program Manager or the Windows shell you are using. There are several CD-ROMs with icons on them and more are available via shareware and commercial services.

You can change an icon by going into File Manager, selecting Preferences with that icon highlighted, and selecting Change Icon. The icons are sometimes stored in the Windows executable itself, in a Dynamic Link Library (DLL) in a separate .ICO file.

## Informs Q & A: Sending Forms via GroupWise



**I will be using Informs and GroupWise. Is it possible to send only one form from Informs to a user via GroupWise?**



Sending forms via GroupWise is one of the top features of Informs. Make sure that the GroupWise users have version 4.1a of the GroupWise client. This will allow them to auto-launch the Informs Filler when they double-click on the message.

## Informs Q & A: Data Entry Into Form

**I have designed a form, but I need to ensure that fields require an entry before exiting the form. This form doesn't use a linked database, so I haven't been able to make use of the required field selection option. Is there any way I can do this?**

The way to do this is to create an exit calculation for each field. In the IF box that appears on the screen, enter the field object name as follows: Object name<". In the Do field of the IF box, enter: @REJECT("Error message goes here). The Otherwise field of the IF box needs to remain blank. When the IF statement detects that nothing is in the field, the @REJECT statement doesn't allow you to go to the next field until the field has been filled in.

## Informs Q & A: Maximum Number of Pages

**I am working on what will be a complex multi-page form. I haven't been able to find a reference to a limit in the number of pages that can make up the form. What is the maximum number of pages an Informs form can consist of?**

There doesn't seem to be a limit. Keep in mind that the more pages a form has, the slower it will run, due in part to the number of data links you have.

## Informs Q & A: Use of IF Statement

**I am trying to find the syntax for the IF statement to use in a calculation I am building into a form. The Inform's Designer manual refers to the IF statement, but I can't find any detailed information. Am I looking in the wrong place?**

No, you aren't. When you create a calculation, the IF box is opened by default. Because of this, you don't need to add the IF to your syntax. The format of the IF statement also doesn't require use of an END IF.

# Informs Q & A: GPF after Installing WordPerfect 6.1

**Since installing WordPerfect 6.1, I get a General Protection Fault (GPF) when trying to open a form. Everything was fine until I installed Word Perfect. How can I fix this?**

If the GPF only happens in one form, the form itself may be corrupt. Try creating a new form with a couple of fields in it. Close then open the form. If the GPF still occurs, exit Windows and run SCANDISK or CHKDSK /f (depending on the version of DOS at the workstation). Try recreating the Windows swap file; especially if it is a permanent swap file, it may have been corrupted. Make sure the temp directory exists on the local hard drive and that the directory is empty. If the copy of Informs on this PC was moved after it was installed, it will need to be reinstalled to correct the problem.

# Informs Procedure List

[Installing Informs Filler to a Workstation](#)

[Installing Informs on the Server Using Design/Filler Pack](#)

## Informs Procedure: Installing Informs on the Server Using Design/Filler Pack

1. Log into the server as Supervisor or equivalent.

2. Insert Diskette 1 into the floppy drive.

3. Type WIN and press the Enter key.

4. Press Alt F, Run.

5. Type A:SETUP and press the Enter key.

6. Select Install and press the Enter key.

7. Enter the name, company name, and product serial number.

8. Select Continue and press the Enter key.

9. Select Network Install Type and press the Enter key.

10. Select Server and press the Enter key.

11. When the Network Install:Informs dialog box appears on the screen, change to the C: to the drive letter mapped to the server for all items on this screen.

12. Select Start Installation and press the Enter key.

13. Press Y to any Create Directory Dialog boxes that appear on the screen.

14. For the location of users initialization files, select the user's Windows directory if each user has his or her own WIN.COM but has a shared master copy of Windows.

15. Enter a drive letter and path to the network copy of Windows only if the user also has a local copy of Windows on his or her hard drive.

16. Select OK and press the Enter key.

17. Select the OK Registration Verification dialog box and press the Enter key.

18. Insert additional diskettes as requested.

19. Select OK and press the Enter key to setup the Informs designer/filler in the

appropriate Windows group.

20. Press N to bypass viewing the README files.

21. Press the Enter key when the Reminder dialog box appears on screen to exit the Informs Install process.

22. Press the Enter key.

23. Create a group for Informs.

24. Assign the appropriate trustee directory rights to the group.

25. Assign members to the group.

# Informs Procedure: Installing Informs Filler to a Workstation

1. Log in to the server as user in Informs group.

2. Start Windows.

3. Press ALT F, Run.

4. Enter the drive letter that is mapped to the volume that Informs is installed on followed by the command \INF41\SETUP.

5. Select Install and press the Enter key.

6. Select Network and press the Enter key.

7. Select Workstation and press the Enter key.

8. Verify the drive and directory that Informs is to be installed in.

9. Press OK and press the Enter key.

10. Confirm the Windows group you want Informs installed in.

11. Select OK and press the Enter key.

12. The installation is complete.

## Informs Required

- Microsoft Windows 3.1

- 386/25 or better CPU

- 4MB RAM or more

- VGA monitor

- 24MB of disk space

**SoftSolutions**

## SoftSolutions Q & A

[cc:Mail and the Remote Document Server](#)

[Combining VIEWER and DLL Directories into a Single Directory](#)

[How SoftSolutions Automatically Starts upon Opening or Saving a File](#)

[No Echo Space Error](#)

[Password Protection from WordPerfect and SoftSolutions](#)

[Sending Information Other Than Documents through RDS](#)

[Suppressing Opening Screen](#)

[Using the Remote Document Server to Send Items Other Than Documents](#)

## SoftSolutions Q & A: Using the Remote Document Server to Send Items Other Than Documents

**Can the Remote Document Server in SoftSolutions 4.1 be used to send items other than documents?**

Yes, it can. Public@Novell.com (via the Internet) or Public@Novell (via MHS) is a good example of how this is done. Although it started as a means to distribute white papers and technical information on GroupWise, it is also being used to send minor programs updates directly to those who request them.

One thing to keep in mind when requesting information from Public@novell over the Internet: The SMTP gateway you are going through to request information must support UUDecode in order to properly receive the files. If it doesn't, you will need to know how to do this task manually.

# SoftSolutions Q & A: cc:Mail and the Remote Document Server

**My company uses cc:Mail as its e-mail platform. I want to implement the Remote Document Server (RDS) in SoftSolutions. What type of equipment do I need?**

RDS requires a dedicated PC. It supports the Messaging Application Program Interface (MAPI) and the Vendor Independent Messaging (VIM) messaging standards. RDS accesses cc:Mail through VIM.

## SoftSolutions Q & A: Password Protection from WordPerfect and SoftSolutions

**Because of the sensitive nature of our documents, they are stored using the password protection option of WordPerfect. Can these documents be integrated with SoftSolutions?**

Yes. You can store password protected documents in SoftSolutions. There are a few limitations that you need to consider when users use password protection for documents. These documents are not full-text indexed and cannot be viewed or opened by SoftSolutions until after the user has entered the password.

Rather than password protecting documents, have users give the document a security rating of Private. In SoftSolutions, this means the author and creator of the document (in most cases, the same person) will be able to see the profile and open the document. The SoftSolutions system manager will still be able to access the document in this scenario.

## SoftSolutions Q & A: How SoftSolutions Automatically Starts upon Opening or Saving a File

**I am a new user of SoftSolutions. How does an application I have configured to work with SoftSolutions understand how to automatically start SoftSolutions when I open or save a file?**

This task is handled by the Windows Registry in a file called REG.DAT. You can see the information stored in this file by running REGEDIT /V in Windows. Use the Find Key function to locate SSProfile in REQ.DAT. This is the command line that all SoftSolutions-integrated applications use when they are opened. You can add additional command line options, such as /user=%nwb, to help streamline the use of the product.

## SoftSolutions Q & A: Sending Information Other Than Documents through RDS

**Can the Remote Document Server (RDS) in SoftSolutions 4.1 be used to send items other than documents?**

Yes, it can. Public_Novell.com (via the Internet) and Public@Novell (via the Message Handling Service [MHS]) are good examples of how this is done. Although these services started to distribute white papers and technical information on GroupWise, they are also being used to send minor program updates directly to users who request them. One thing to keep in mind when requesting information from Public@Novell over the Internet is that the Simple Mail Transfer Protocol (SMTP) gateway you are using to request information must support UUDecode in order to properly receive the files. If it doesn't, you will need to know how to UUDecode files manually.

## SoftSolutions Q & A: No Echo Space Error

**I have started getting a "No Echo Space" error when I use SoftSolutions. Running Janitor doesn't solve the problem. Deleting all the files in the ECHO directory doesn't fix the problem. Do you have any suggestions?**

In the ECHO directory there is a file called SSECHO that keeps track of the space used in the ECHO directory. If the number in this file is not correct, it could explain the problem you are seeing. If your ECHO directory is currently emptied of all files, you can delete SSECHO. It will automatically be recreated the next time documents are echoed to the directory. Another area to check is the Setup, Workstations option to make sure you haven't exceeded the maximum size for the ECHO directory. You may need to increase that value.

## SoftSolutions Q & A: Suppressing Opening Screen

**I have users who are remotely running SoftSolutions (Windows version) via the Carbon Copy or ReachOut remote control programs. They are complaining that it takes a long time to paint the SoftSolutions opening screen. Can these users suppress this screen to speed up operations?**

No. There isn't an option to disable that screen. You might want to try using the DOS version of SoftSolutions to get around the problem. Also, check the modem speeds your users are set at; if they are using 14,400 bits per second or faster modems, the opening screen should take around 5 seconds to paint--unless you have noisy phone lines.

## SoftSolutions Q & A: Combining VIEWER and DLL Directories into a Single Directory



**I have both GroupWise and SoftSolutions installed on the server. The directory structure needs simplifying. Can the VIEWER directories and associated Dynamic Link Libraries (DLLs) from both products be combined into a single directory and referenced accordingly?**



No. For the time being, you will need to leave these files in their respective directories. They are unique for each product. In the future, as Novell continues streamlining the code and furthers the shared code-concept, the products will use the same files.

# SoftSolutions Procedure List

[Configuring the Remote Document Server](#)

[First-Time Installation of SoftSolutions 4.1](#)

## SoftSolutions Procedure: First-Time Installation of SoftSolutions 4.1

1. From Windows, select Alt-F, Run.

2. Enter D:\INSTALL (in which D: is the CD-ROM drive letter) and press the Enter key.

3. Select Express Installation and click on OK.

4. Verify the parent (or destination) directory where SoftSolutions is to be installed and click on OK.

5. Enter the company name and serial number for SoftSolutions in the SoftSolutions for Windows Install dialog box and click on OK.

6. Select the integrations you need from the Application Integration Installation dialog box.

7. Click on the Select button to move the desired integration into the Integrations Selected column.

8. Click on the OK when all desired integrations have been selected.

9. You will be presented with a dialog box to enter the path for each of the applications you want to integrate.

10. Enter the path or use the Browse function to enter the path and click on OK to proceed.

11. Repeat Steps 9 and 10 until all the selected applications have been integrated.

12. You will receive a dialog box asking for a code name and password for system manager access. Enter SS for the code, Admin for the name and a password of your choosing for the password. Click on OK to proceed.

13. When the SoftSolutions installation is finished, you will be presented with a dialog box indicating that the INSTLOG may be reviewed for steps taken during the installation.

## SoftSolutions Procedure: Configuring the Remote Document Server

1. Create a login ID for RDS to use on the server where SoftSolutions is stored.

2. Assign the login ID the appropriate trustee directory rights to access SoftSolutions, the documents that are being stored, and the e-mail system you are integrating this with.

3. Create a section in the System or Container Login Script for RDS to use to map drives to all servers and volumes where SoftSolutions documents are stored.

4. Go to the GroupWise domain directory on this server and run AD.EXE.

5. Press Control U to bring up the screen to create a user.

6. Enter SOFTSOL for the user name and press the Enter key (this is the default name that the RDS macros for GroupWise are set to use).

7. If you are running GroupWise on a 4.x server, edit line 8 (the network ID) to correctly reflect the login name and the proper NDS context.

8. Log in to the server using the RDS login.

9. Execute the Windows GroupWise client.

10. Choose Alt-F, Preferences.

11. Double-click on the Location of Files icon.

12. Change the Custom Views directory to reflect the path to the SoftSolutions program directory.

13. Click on OK and exit GroupWise.

14. Select Alt-F, Run.

15. Enter the drive letter and directory for SoftSolutions and add on \PROG\ SOFTWIN and press the Enter key.

16. To verify correct installation, answer the SS login prompts with the SS Admin login name and password.

17. Exit Windows and change to \SOFTSOL\PROG.

18. Using a DOS text editor, edit RDS.CFG.

19. Edit the data line to point to the data directory under SOFTSOL (e.g., \ SOFTSOL\DATA).

20. Edit the STRDIR line to point to the SoftSolutions program directory (e.g., \ SOFTSOL\PROG).

21. Edit the MAILUSER line to reflect the GroupWise user id (e.g., SOFTSOL).

22. Consult the *SoftSolutions Users Guide* to see if any of the other options in RDS.CFG need to be changed or deleted.

23. Save the file and exit the DOS editor.

24. In Windows, open the Startup folder.

25. Select File, New, Program Item and click on OK.

26. Enter RDS in the Description box.

27. Enter G:\SOFTSOL\MAPIUSER.EXE G:\SOFTSOL\RDS.CFG in the Command Line box and click on OK (you may need to change the drive letter to reflect the one you are using).

28. GroupWise users need to send a message to SOFTSOL once RDS is running with the work HELP in the body of the message. This will send them a reply message with the GroupWise macro needed to access the RDS server.

## SoftSolutions Required

- 386SX or better CPU

- 4MB RAM (8MB RAM recommended)

- Dedicated indexer for every 100 to 125 workstations

## Global MHS and MHS

## Global MHS and MHS Q & A

[Automatic Forwarding of Messages](#)

[Exchanging Mail via the MultiProtocol Router over the Internet](#)

[Message Pickup Shutting Down](#)

[MHS Message Structure](#)

[Modem-sharing with NetWare Connect](#)

[Sending Mail via the Internet](#)

[Sending Messages from SMF-71 to SMF-70 Hosts](#)

## Global MHS and MHS Q & A: Modem-Sharing with NetWare Connect

**Can Global MHS share a modem with NetWare Connect?**

Global MHS requires a dedicated port for each modem that receives and makes calls. It can use some but not all the ports on a multiport serial adapter, such as a Digiboard.

## Global MHS and MHS Q & A: MHS Message Structure

**I am working on a specialized application that needs to use the Message Handing Service (MHS) to send messages between different parts of the process. Where can I find out more about the MHS message structure?**

Call Novell's Professional Developer's Program at (800) NET-WARE and order the *SMF-71 Programmer's Reference* manual. It is the official Novell publication on the Simple Message Format used by MHS.

# Global MHS Q & A: Automatic Forwarding of Messages

**Is there any way I can have mail sent to an address such as INFO automatically forwarded to the user I want to handle this message?**

Yes. Create a text file called FORWARD.SMF and place it in the MHS\MAIL\ USERS\user_name directory (replace user_name_ with the e-mail address that you want to redirect e-mail from). Add the following line to that file:

Forward-to: Recipient_address

Replace Recipient_address with the destination e-mail address that should receive the forwarded mail (i.e., jsmith@service). You should be able to place a "Keep-local-copy:" statement in this file with a TRUE or FALSE statement to indicate whether or not to keep a copy of the message in the mailbox of the account that is forwarding the initial message.

## Global MHS Q & A: Message Pickup Shutting Down

**I am having a problem with Global MHS indicating that it is shutting down message pickup. It then shuts down completely due to insufficient free Global MHS memory. The server in question has 128 megabytes (MB) of RAM installed. The cache buffers are currently sitting at 70 percent. Why won't Global MHS stay loaded?**

If you look at the short-term memory allocation in MONITOR.NLM, it probably is set to the default limit of 2MB. You might try placing the following statement in the server's AUTOEXEC.NCF file:

SET MAXIMUM ALLOC SHORT TERM MEMORY = 8000000

This will set the short-term memory allocation to 8MB.

## Global MHS Q & A: Sending Mail via the Internet

**We currently have Global MHS installed on our network. What do we need to do to send mail via the Internet?**

You have several options. By setting up an account on CompuServe or one of several third-party providers, you can send Internet e-mail via your existing Global MHS server. One thing to keep in mind when looking at different providers is whether or not they support file attachments when sending Internet Mail. CompuServe returns messages that have files attached to them. Another option is the Simple Message Transfer Protocol (SMTP) add-on for Global MHS. This requires that you have a direct Internet connection (i.e., a dedicated data line) to the Internet Service Provider's Point-of-Presence.

## Global MHS Q & A: Exchanging Mail via the MultiProtocol Router over the Internet

**Is it possible to establish an Internet connection via the NetWare MultiProtocol Router (MPR) without using a dedicated data line to exchange e-mail? We would also like to be able to use this link for FTP.**

You should be able to do this, but it will take a very understanding Internet Service Provider and the asynchronous dial-on-demand function of MultiProtocol Router (MPR) 3.0. For best performance, you will need a high-speed serial adapter such as a Hayes ESP card or a Digiboard.

## Global MHS Q & A: Sending Messages from SMF-71 to SMF-70 Hosts

**I am trying to send a message to a remote host that is configured for SMF-70. Our host is configured for SMF-71. When sending a message, the message keeps being directed to NHUB for delivery instead of to the proper host. What is the problem?**

In your configuration, when sending a message to an SMF-70 host, you will need to use SMF-71 MHS hubs or the workgroup's name to get the message to the proper recipient. Global MHS will make the appropriate addressing conversions when the message is delivered to the SMF-70 host (such as changing your return address to the SMF-70 format from SMF-71). The reason that NHUB is selected for delivery of the message is that it has been assigned the null workgroup, which indicates that all messages that can not be delivered to hosts it already knows about will be dropped off at NHUB.

## Global MHS and MHS Procedure List

[Check on Messages Waiting for Delivery in Global MHS](#)

[Creating a Distribution List in Global MHS](#)

## Global MHS and MHS Procedure: Creating a Distribution List in Global MHS

1. At the server's colon prompt, type LOAD NGMADMIN and press the Enter key.

2. Select WorkGroups, Users and DLISTS and press the Enter key.

3. Select Distribution lists and press the Enter key.

4. Press the Insert key.

5. Enter the name of the distribution list you want to create and press the Enter key.

6. Enter a description of what this DLIST will be used for and press the Enter key (optional step).

7. Press the Enter key on the Error Mailbox and select an individual to receive errors about this DLIST(optional step).

8. Press ESC and press the Enter key to save the configuration settings.

9. Highlight the DLIST you just created and press the Enter key.

10. Select the Member List option and press the Enter key.

11. Press Ins to display the list of Available Members and DLISTS.

12. Highlight a name and press the Enter key.

13. If you are adding multiple users at the same time, as the desired name is highlighted, press F5 to mark it and press the Enter key only after all the desired names have been marked.

14. To add a name to the DLIST for someone who isn't displayed (e.g., a user on a different MHS host), select Insert New Member Not in List and press the Enter key. Enter that user's full e-mail address and press the Enter key.

15. Press Esc after all names have been added.

16. Press Esc three times to return to the Global MHS main menu.

## Global MHS and MHS Procedures: Check on Messages Waiting for Delivery in Global MHS

1. At the server's console prompt, type LOAD NGMADMIN and press the Enter key.

2. Select Maintenance from the main menu and press the Enter key.

3. Select Queues from the Maintenance options and press the Enter key. This will display the Waiting Messages by server.

4. Select one of the Messaging Servers from the list and press the Enter key.

5. Select List Messages in Queue and press the Enter key. This will provide a list of all messages waiting for delivery with specifics of sender, sent time and date, message size, number of delivery attempts, and receiver of the message.

6. Press Esc three times to return to the NGMADMIN main menu.

## Global MHS and MHS Requirements

- 8MB of free disk space

- Serial port (AIO compatible)

- High speed modem

- 6MB of RAM additional

## Global MHS and MHS Utilities

DaVinci eMAIL (Free 30-Day Trial) by On Technology Corp.

Notework Electronic Mail (Free 30-Day Trial) by On Technology Corp.

## Global MHS and MHS Utility: Notework Electronic Mail (Free 30-Day Trial) by On Technology



Notework Electronic Mail includes support for Macintosh, Windows NT, DOS, and Windows 3.1 clients.

To install this software, copy the directory D:\PROGRAMS\NOTEWORK to your hard disk. Then run the INSTALL.BAT file from the Windows Program Manager File Run command line. If your hard drive is designated as drive C, type C0NOTEWORK\INSTALL.BAT and choose OK.

## Global MHS and MHS Utility: DaVinci eMAIL (Free 30-Day Trial) by On Technology



DaVinci eMAIL includes NetWare Directory Services (NDS) support as well as NetWare MHS-based electronic mail capability for DOS, Windows and Macintosh environments.

To install DaVinci eMAIL, copy the subdirectory D:\PROGRAMS\DAVINCI to your hard disk. From the hard disk, follow these installation instructions:

1. Log in as "ADMIN" on a 386 or higher PC-compatible workstation with at least 2MB of RAM and DOS 3.3 or higher.

If you do not have an ADMIN user name with supervisory rights on the network, you can use any user name that has supervisor equivalence.

2. Run Windows.

3. Select RUN from the File menu.

4. Click on the Browse button to select the drive that contains the subdirectory containing the files you copied from the CD-ROM, then select SETUP.EXE and click on OK.

   Example: C:\DAVINCI\SETUPWIN.EXE

5. Click on the OK button.

6. Read the introduction at the bottom of the Setup screen, then click on the Install DaVinci eMAIL button.

7. Click on the Browse button if you wish to change the eMAIL installation.

Specify a different location for the new eMAIL installation, including the name of the directory for eMAIL itself.

   Example: M:\PUBLIC\DAVINCI

8. Note: Make sure the path you specify is accessible to all your users; all users should have a drive mapped to that SERVER/VOLUME. Use a drive letter and a complete path syntax for the installation, not server/volume syntax. The Browse feature will help you avoid typos and incorrect syntax.

8. Click on the OK button.

The SETUP program will display the Disk Space Required to install the eMAIL program and its files.

9. Click on the Install button to continue.

Follow the instructions on the screen while the SETUP program installs eMAIL.

After SETUP finishes, you will be returned to the Windows Program Manager for a few seconds as SETUP closes and ADMIN loads.

++++++++++

# Personal NetWare

**CD HELPdesk Series: Novell Products**

Click on any icon for more information

## Personal NetWare Q & A

[Access to CD-ROM Drive on NetWare 4.x](#)

[Can't Log In More Than Four Workstations](#)

[Connecting Two 10BASE-T Nodes](#)

[Diskless Workstation Problem](#)

[Increasing Maximum Number of Printers](#)

[Installing Novell DOS without Personal NetWare](#)

[Modem Sharing](#)

[NETWARER.DRV Error after Installation](#)

[Upgrading from NetWare Lite](#)

[Using Non-ODI Drivers](#)

[Workstations Can't See Each Other](#)

## Personal NetWare Q & A: Modem Sharing

**We have several modems in the office attached to workstations that never seem to be in the right place for everyone. Is it possible to pool these modems and share them without being located at a particular PC? We are using Personal NetWare.**

Personal NetWare is not able to handle modem pooling because it does not support serial port redirection. You will need to look at a product such as NetWare Connect, in which all modems are connected to the same device, or at a third-party peer-to-peer system modem-sharing package. The disadvantage of peer-to-peer networking is that you depend on a particular computer being attached to the network. The more demanding your downloading or communications process is, the more it slows down the person's computer whose modem you are using.

# Personal NetWare Q & A: Connecting Two 10BASE-T Nodes

**I have two workstations I want to connect together. The network adapters are 10BASE-T. Do I have to use a 10BASE-T hub to connect them together?**

According to the 10BASE-T standard, the answer is Yes. In reality, though, as long as the workstations are within 20 feet of each other, you can connect them without a hub. This requires what is called a crossover cable. The cable has both pairs of wires crossed. See the diagram below:

| Regular Cable | Crossover Cable |
|---|---|
| 1-1 | 1-3 |
| 2-2 | 2-6 |
| 3-3 | 3-1 |
| 6-6 | 6-2 |

# Personal NetWare Q & A: Increasing Maximum Number of Printers

**I am trying to add a printer to Personal NetWare. When I try to add one, I get a message that says the maximum number of shared printers exist on this server. How can I increase the maximum number of printers allowed on a Personal NetWare server?**

There are two ways of doing this. You can use the NET ADMIN utility (DOS) or WNET.EXE (Windows). Edit the properties of the server by highlighting the server and pressing the Ctrl and Enter keys. Choose Configure and then increase the number of total shared printers. For the changes to take place, you will need to reboot the Personal NetWare workstation that will be servicing the additional printer.

## Personal NetWare Q & A: Diskless Workstation Problem

**I am trying to set up a diskless workstation under Personal NetWare. After I turn on the diskless workstation, I get the following error message: "RBOOT-RPL-104: Unable to OPEN NET$DOS.SYS; RPL HALTED." What do I need to do?**

Review the RPLDOC.TXT file on the Personal NetWare disk to verify you have followed all the required steps. Check to make sure you have loaded NEARSERV (which responds to the RPL request from the diskless workstation) on the server that contains the boot image. If you haven't already done so, apply the update files for Personal NetWare (P10U05.EXE, which is downloadable from NetWire to all your workstations.

# Personal NetWare Q & A: Access to CD-ROM Drive on NetWare 4.x

**I have several users that need to share a common CD-ROM drive, but I don't need them to log in to the NetWare 4.x server on our network. Can I put the Personal NetWare workstations on our existing cabling system without doing anything special?**

You shouldn't have any problems. Until the Personal NetWare workstations run VLM.EXE, they won't be able to see the NetWare 4.x NetWare server on your network. By the same reasoning, the other users on your network won't be able to see or log into the Personal NetWare server in this workgroup until they have a copy of Personal NetWare installed on their workstations. This is an illustration of how Personal NetWare can be used to help a few users without requiring significant changes in network hardware or configuration to accommodate them.

## Personal NetWare Q & A: Using Non-ODI Drivers

**I have a network adapter that is so old it only has drivers for genning IPX.COM. I have been unable to find any Open Data-link Interface (ODI) drivers for this adapter. Can I use it with Personal NetWare?**

You will need to purchase a newer network adapter that has ODI drivers (just about all of them do now). IPX.COM is not supported by Novell for use with VLM.EXE. You might be able to get it to work but it will provide intermittent performance at best. Using ODI drivers gives you much more flexibility than was possible with IPX.COM.

## Personal NetWare Q & A: Installing Novell DOS without Personal NetWare

**I recently purchased the Novell DOS 7/Personal NetWare combination. It was cheaper than buying just Personal NetWare. Is it possible to install Personal NetWare without installing Novell DOS 7?**

Yes. Check the NDESKTOP forum on CompuServe. A file posted there describes how to install Personal NetWare only from the Novell DOS 7 disk.

# Personal NetWare Q & A: Upgrading from NetWare Lite

**I would like to upgrade my NetWare Lite network to Personal NetWare. Can it be done? How?**

Yes. Install Personal NetWare on one of the workstations. Log into the workgroup as Supervisor and assign the server to a workgroup. At the DOS prompt, change to the NWCLIENT subdirectory and execute the NLMIGRAT program. This will perform the conversion for you. Keep in mind that Personal NetWare and NetWare Lite will not work together, due to differences in the way they communicate. You will need to convert all the NetWare Lite workstations to Personal NetWare at the same time.

# Personal NetWare Q & A: Workstations Can't See Each Other

**I have a five-user Personal NetWare installation. Three of the workstations see each other and the remaining two see each other, but the two groups don't see each other. I have verified that the cabling is correct and that the network adapters are working properly. Do you have any suggestions?**

Check the NET.CFG file in each of the workstations to see that they all reference the same frame type. Make sure that your cabling is not too long at any one point. Try connecting just four of the workstations and see if the situation improves.

# Personal NetWare Q & A: NETWARER.DRV Error After Installation

**After installing Personal NetWare, I began to get an error message in Windows: "File error: NETWARER.DRV not found." I have reinstalled Personal NetWare several times with the same result. Do you have any suggestions?**

The first thing to check is that Windows is configured for Personal NetWare. The error you are describing is usually seen when NetWare application program interface (API) calls are made by a program in Windows and Windows doesn't know anything about the network. You can check using either Windows or DOS setup programs. Look at the Network line; it should mention Personal NetWare v1.0. If it doesn't, this is the cause of your problem.

## Personal NetWare Q & A: Can't Log In More Than Four Workstations

**I haven't been able to get more than four workstations logged into my Personal NetWare server at any one time. I have logged in as Supervisor, increased the number of future connections to six, and rebooted the server. The number of connections hasn't increased and the future number of connections is showing six. Do you have any ideas?**

When making changes of this type, make sure that you are using NET ADMIN. When leaving the Advanced Settings screen, Tab to the OK button and press Enter. Don't press the Esc key to exit. When you use the Esc key, the settings you have changed are not saved. If changes have been made successfully, you should get a message about the changes taking effect the next time the server is loaded. To see the changes, you will need to reboot the server.

# Personal NetWare Procedure List

[Creating a Shared Printer in Personal NetWare](#)

[Installing Personal NetWare](#)

## Personal NetWare Procedure: Installing Personal NetWare

1. Insert the diskette labeled Installation and Utilities 1 into diskette drive.

2. Type Install and press the Enter key.

3. Press the Enter key when the Install screen is displayed.

4. Enter the user's name and press the Enter key.

5. Enter the company name (if any) and press the Enter key.

6. Enter the serial number of Personal NetWare (found on the back of diskette 1) and press the Enter key.

7. Press the Enter key to Accept and continue.

8. If you don't want to have Windows Support installed, press Tab key until the small square check box is highlighted and press the Space bar to clear the check in the box.

9. If you want to change the drive or subdirectory Personal NetWare will be installed to (this is not recommended), highlight the Change Drive and Subdirectory button and press the Enter key.

10. To continue with the installation, highlight the Continue button and press the Enter key.

11. Enter a name for the user of this computer and press the Enter key.

12. For this computer to be a Personal NetWare server, select the Share This Computer's Resources option.

13. If the network adapter in your PC isn't automatically identified, highlight the Primary Network Interface Card line and select the appropriate driver.

14. Select Server Types to Connect To; Personal NetWare should be selected. (If you also want to connect to a NetWare v2.x, v3.x, or 4.x server, make sure these items are selected and press the Enter key.

15. Select Accept the Above and press the Enter key.

16. Select Optimization/Network Management and press the Enter key.

17. If you currently have SMARTDRV loaded, you will want to deselect the

loading of NWCACHE or this will conflict with SMARTDRV.

18. The Network Management options can be left unselected if you won't be using a network management package such as ManageWise.

19. Select Accept the Above and press the Enter key.

20. Select Configure the Primary Interface Card and press the Enter key.

21. Select the appropriate values for port (i/o) and interrupt (IRQ) (not all drivers require an IRQ selection).

22. If configuration for an ISA box, the slot choice can be left at the default of 1.

23. Select either ETHERNET_802.2 or 802.3 for use by Personal NetWare (select the same frame type on all Personal NetWare workstations).

24. Select Accept the Above and press the Enter key.

25. Select Accept the Above and press the Enter key.

26. Select Start Installation and press the Enter key.

27. If prompted to overwrite a more recent file, select No and press the Enter key.

28. Insert additional diskettes as prompted.

29. Press the Enter key when the Install is Complete message appears.

## Personal NetWare Procedure: Creating a Shared Printer in Personal NetWare

1. Log into Personal NetWare as Server Owner or Admin.

2. Type NET ADMIN and press the Enter key.

3. Select the View menu.

4. Choose Shared Printer and press the Enter key.

5. Press the Insert key.

6. Type a name for the printer (e.g., printer brand name or location) and press the Enter key.

7. Select the Personal NetWare server and the port the printer is connected to.

8. Select OK when finished.

9. The server where the printer has been defined will need to be restarted before the printer will be available.

## Personal NetWare Requirements

- 640KB DOS; 2MB for Windows

- Novell compatible network adapter

- 6 to 8MB of disk space

- Cable to connect the computers together

## NetWare for SAA

## NetWare for SAA Q & A

# Printing More than 132 Characters per Line with HostPrint/400

**How do I print more than 132 characters per line with HostPrint/400?**

Confirm that the printer is capable of printing in condensed mode. Configure the printer in HostPrint/400 for Host Transform Mode. Make sure that the AS/400 operating system supports more than 132 characters per line on the specified printer. Set the form type to the default printer definition in CFGHP400.EXE. If the AS/400 operating system (known as OS/400) is earlier than v3r1, call IBM for printer PTFs. If it is later than v3r1, check the printer definitions on the AS/400.

# HP400.EXE DOS Program and Printing the HP400 Configuration

**Why can't I use the HP400.EXE DOS program to print my HP400 configuration?**

Novell accidentally didn't copy the file on the HP400 diskette. You can download it from CompuServe, Novell's FTP site, or from Novell's WWW site.

## AS400PCS Error 4 with More Than 10 People

**Why do I get an AS400PCS error 4 when I have more than ten people using the SAA 2.0 router on my Netware v3.12 server.**

It is possible that your LAN driver or one of the following modules is old: CLIB.NLM, ETHER.TSM, TOKEN.TSM, ETHER.MSM, or TOKEN.MSM,. The error may also refer to a verb problem between NetWare for SAA 2.0 and the Communications Executive. All but the LAN driver can be updated by using LIBUP5.EXE, found either on NetWire, NSEPro, or on the Novell WWW or FTP sites. The LAN driver may be updated from LANDR4.EXE; if not, you will have to contact either a section of CompuServe for your LAN adapter manufacturer or the manufacturer directly. Follow the instructions for installing LIBUP5.EXE and LANDR4.EXE. Replace the existing LAN driver with a new one and down the server. Upon restarting the server, you may add additional users.

# AS400PCS and Server ABENDs with NetWare for SAA 1.3B

**Why does my AS400PCS in NetWare for SAA 1.3B unload or ABEND the server?**

You have upgraded your AS400 operating system to OS400 3.1 or greater and you are using the update parameter in the client CONFIG.PCS file. NetWare for SAA 1.3B does not support automatic update through the router from OS400 version 3.1. Remove the update parameter from the CONFIG.PCS file.

## NetWare for SAA Q & A: SPX Errors

**While I was performing a file transfer at a workstation through a NetWare for SAA gateway, I received the error message "WTSPX Post Error 65." The file transfer doesn't complete. The technical support department for the terminal emulation software I am using says the problem isn't theirs. What do I look for?**

The first thing to do in this situation is make sure you have the latest revision of VIPX.386, VNETWARE.386, and the various dynamic link libraries (DLLs) used by the NetWare client in Windows. Then verify that the versions of LSL.COM, IPXODI.COM, NETX.EXE, VLM.EXE, and the driver for the network adapter you are using are the latest versions available. Download NWDLL2.EXE, WINDR2, and VLMUP2.EXE from NetWire. After applying these files, the problem should be fixed.

# NetWare for SAA Q & A: Attaching to the Wrong Server on WANs

**I have a server running NetWare for SAA that's connected to a WAN. Another division has a server connected to the WAN that is also running NetWare for SAA. Users at my location are intermittently having the problem of attaching to the wrong server. How can I isolate the login process to just my server?**

Use the PREFERRED SERVER = <server_name> command in the NET.CFG  file on the workstations as a first step. Depending on the terminal emulation software you are using, you may be able to specify the NetWare for SAA server a workstation should be attaching to as a secondary option.

# NetWare for SAA Q & A: System/36 Twinax Connections

**I need to be able to connect our System/36 to the network. Is my only option to connect via a twinax connection?**

No. Using a Synchronous Data Link Control (SDLC) connection is possible, but your System/36 may not have this type of connection. NetWare for SAA doesn't support the System/36. You might be able to find one of the older Systems Network Architecture (SNA) gateways that will let you connect it.

## NetWare for SAA Q & A: Patches for NetWare v3.12

**I am installing NetWare for SAA on a NetWare v3.12 server. What patches or update files should I apply before starting?**

Get STRTL3.EXE from NetWire and apply the appropriate SPX protocol patches. Also download LIBUP5.EXE for the latest CLIB.NLM and related files. Apply the patches in LANDR4.EXE for the latest updates to MSM31X.NLM, ETHERTSM.NLM, and similar files that are used on your server. Check NetWire or Novell's FTP site on the Internet for updates to the version of NetWare for SAA you are installing.

# NetWare for SAA Q & A: AS/400 Printing

**When I load HostPrint/400 on the NetWare for SAA gateway, I see the normal initialization messages indicating that AS/400 printer sessions are being established. No print jobs are being sent from the AS/400. The QSYSOPR message queue on the AS/400 indicates a problem initializing the print writer. What do I need to look at?**

The first thing you need to look at is the version of OS/400 (the AS/400's operating system) that your AS/400 is using. If it is version 2 release 2 or earlier, you can only use the local transform printer mode. This mode appears to the AS/400 as a 5256 single-font line printer. In this mode, NetWare is responsible for sending mode changes, such as fonts, to the printer. OS/400 version 2 release 2 acknowledges host transform printers (which appear to the AS/400 as 3812 multi-font line printers). Because there is a bug in this version of OS/400, HostPrint/400 will error out when trying to print to this type of printer. The best way to fix this problem is to have the AS/400 system operator or security officer delete the printer and print writer (the AS/400 equivalent of a NetWare print queue), turn on AUTO CONFIG, and unload and reload HostPrint/400.

# NetWare for SAA Q & A: HostPrint/400 and AS/400 Access

**The security officer for the AS/400 needs to know the level of access the HostPrint/400 login ID needs to the AS/400. He is very concerned about security holes.**

The login ID for HostPrint/400 can be very minimal. The ID only needs to authenticate to the AS/400 and nothing else. As long as the print writers (the AS/400 equivalent of print queues) are accessible to any user, this should be okay.

# NetWare for SAA Q & A: Lost Connection

**Since I loaded the patch NetWare Loadable Modules (NLMs) from STRTL3, no one can log into the server and all existing connections to the server are lost. What can I do?**

The first thing to check is that you are using the latest version of the NLMs that are included in LANDR4.EXE (or the latest version of this file). The Sequenced Packet Exchange (SPX) protocol patches may cause a problem with earlier versions of some of the files in LANDR4.EXE (such as those that ship with NetWare v3.12). In case the network adapter you have in the server doesn't have a replacement driver in the driver update file from Novell, contact the manufacturer of your network adapter to get the latest revision of the driver.

## NetWare for SAA Q & A: HostPrint/400 and OS/400 Version 3 Release 1

**Since upgrading our AS/400 to OS/400 Version 3 Release 1, NetWare for SAA still loads and gets a connection to the AS/400, but HostPrint/400 has problems. It initially connects to the AS/400, but reports that it can't establish a printer session on the AS/400. What's wrong?**

When IBM wrote OS/400 Version 3 Release 1, it made significant changes to the communications process on the AS/400. Make sure that you have applied the latest patches to NetWare for SAA; this should fix the problem. If you haven't already done so, make sure that you have the latest version of the driver for the network adapter in the server that is communicating with the AS/400 and that you've applied LANDR4.EXE (or the latest version of this file).

## NetWare for SAA Q & A: Licensing and AS/400s

**We are getting ready to connect an AS/400 and a mainframe to the LAN. We will need about 20 connections to the AS/400 and about 30 to the mainframe. What license count will we need to purchase for NetWare for SAA to accommodate this configuration?**

A 32-user version of NetWare for SAA should be sufficient. PC/Support connections are independent connections. Mainframes use dependent connections. The 32-user version of NetWare for SAA gives you 32 independent and 32 dependent sessions at the same time. The only other point to keep in mind is that when you use HostPrint or HostPrint/400 with NetWare for SAA, each printer session requires a user connection in the service profile of the host it is connecting to.

## NetWare for SAA Q & A: 802.2 Link Errors

**When loading the service profile in NetWare for SAA, the file server beeps and a message is displayed on the console that the 802.2 Logical Link Control (LLC) link is disconnected. This message is followed by an 802.2 LLC link connected message. Why is the link being disconnected just after the service profile is loaded?**

The link disconnected message is normal just after a service profile has been loaded. It indicates that the profile has successfully loaded and that the network adapter has been initialized. When the service profile has been configured to talk to an AS/400, you may see the disconnected and connected messages more often because of the way NetWare for SAA talks to an AS/400. A disconnected message during normal operations can be expected when users are talking to the AS/400 and the AS400PCS.NLM router drops the AS/400 connection. Frequent connect and disconnect messages can also be signs of communications problems with the host system.

## NetWare for SAA Q & A: PC/Support

**We are upgrading our AS/400 to OS/400 Version 3 Release 1. Do we need to upgrade the files at the client that runs PC/Support to the newer client/server architecture that is supplied with the new version of the IBM operating system for the AS/400?**

If you are running NetWare for SAA version 1.3, do not upgrade the workstation files to the newer version. By doing so, you will abend the server when the files execute. The existing PC/Support files should work fine with the latest version of OS/400. Shared folders support shouldn't have any problems either.

If you fit this configuration make sure that you remove any mention of PCSUPDT from the STARTPCS.BAT file on the workstation. It would also be a good idea to remove the UPDT line in the CONFIG.PCS file on the workstation.

## NetWare for SAA Q & A: HostPrint Host Errors

**When loading HostPrint on the NetWare for SAA gateway, I receive an error message that a host connection is not found. The service profile for the host has already been loaded. Why is HostPrint having this problem?**

The NetWare for SAA service profile probably hasn't completely loaded when HostPrint is trying to load. Try manually loading HostPrint at least 30 seconds after the service profile loads. If this fixes the problem, look for a NetWare Loadable Module (NLM) named DELAY.NLM. This NLM will delay the execution of a LOAD statement for a specified period of time. More than likely this NLM will fix the problem.

If you are still having a problem, check the configuration of the service profile and check with the host support people to see if they have made the appropriate changes on their end for supporting your connection for printers and terminal sessions.

# NetWare for SAA Q & A: LU1 and LU3 Printer Differences

**What is the difference between a Logical Unit (LU) 1 and an LU3 printer?**

In LU1 printers, the host computer system can send printer formatting codes with the print job to the printer. This is known in the mainframe community as SCS code 35 or host printer transparency. LU3 printers cannot receive this type of information.

## NetWare for SAA Procedure List

[Installing NetWare for SAA v2.0 from Server's CD-ROM Drive](#)

[Loading Patches from The Server](#)

## NetWare for SAA Procedure: Loading Patches From The Server

1. Create a directory off of the root called SAApatch.

2. Create a subdirectory for each patch according to its name (e.g., SAA014).

3. Copy the contents of the Patch disk to the appropriate directory.

4. To apply the patch, type CSDOWN at the server's console prompt and press the Enter key.

5. At the server's console prompt, type UNLOAD COMMEXEC and press the Enter key.

6. At the server's console prompt, type LOAD INSTALL and press the Enter key.

7. Select Product Options and press the Enter key.

8. Press Ins and type SYS:SAAPATCH\PATCHNAME (substitute the name of the patch directory here).

9. Press the Enter key to start the patch installation.

10. Repeat Steps 8 and 9 for all patches to be applied.

## NetWare for SAA Procedure: Installing NetWare for SAA v2.0 From Server's CD-ROM Drive

1. Put the NetWare for SAA 2.0 CD in the server's CD-ROM drive.

2. Mount the CD as a volume.

3. At the server console prompt, type LOAD INSTALL and press the Enter key.

4. Select Product Options.

5. Press the Insert key.

6. Type the volume name of CDROM:COMMEXEC\DISK1 and press the Enter key (e.g., NWSAA:COMMEXEC\DISK1).

7. Select Install on this Server and press the Enter key.

8. If prompted, answer yes to Install a NDS commexec object, verify the admin login name and password and press the Enter key.

9. Press the Insert key.

10. Type the volume name of CDROM:NWSAA\DISK1 and press the Enter key (i.e NWSAA:NWSAA\DISK1).

11. Select Install on this Server and press the Enter key.

12. Press Esc when you have read the README file after the installation has completed.

13. Press the Enter key when the Restart Server reminder message has displayed.

14. Press the Enter key again.

15. Unload the INSTALL.NLM.

## NetWare for SAA Requirements

**Server requirements:**

NetWare v3.x or 4.x

- Memory: 8 megabytes (MB) minimum; higher user counts will require additional amounts of RAM depending on the amount of host traffic.

- Disk space: No significant requirements

- Host link option: Requires a network adapter if accessing via an Ethernet or token-ring connection. Also supports Synchronous Data Link Control (SDLC), X.25, and channel-type attachments

**Client requirements:**

- Requires an IBM 3270 or 5250 terminal emulation package, depending on the type of host(s) being accessed

## NetWare for DEC Access



**CD HELPdesk Series: Novell Products**

Click on any icon for more information

## NetWare for DEC Access Q & A

[Access to a Digital Alpha Workstation](#)

[Access via T1](#)

[Macintosh Connections to VAX](#)

[Patches for NetWare 4.10](#)

# NetWare for DEC Access Q & A: Macintosh Connections to VAX

**I have installed NetWare for DEC Access and now have a department with several Macintoshes that need access to the VAX. How can I get this to happen?**

The easiest way is to install LAN Workplace for Macintosh on the Macintosh clients and have them telnet to the NetWare for DEC Access server. This will involve loading TCP/IP on the network adapters in the server, but other than that, it shouldn't be too involved.

## NetWare for DEC Access Q & A: Access to a Digital Alpha Workstation

**Our IS group has installed a Digital Alpha workstation for one of the departments. What is required for users with PCs to be able to access it?**

Since the Digital Alpha workstation supports Local Area Transport(LAT), PC workstations can connect to it by using NetWare for DEC Access on the NetWare server. The PC clients will need to use a terminal emulation program, such as Wall Data's Rumba or Walker Richer Quinn's Reflection. The NetWare server will need to have a direct Ethernet link to the Digital Alpha workstation, since LAT is not a routable protocol.

## NetWare for DEC Access Q & A: Patches for NetWare 4.10

**We are getting ready to upgrade our NetWare server to NetWare 4.10. Are there any updates to NetWare for LAT we need to apply?**

No updates or patches have been issued for NetWare for LAT since LAT001.EXE. You may want to consider upgrading to NetWare for DEC Access. This version is specifically for NetWare 4.10.

## NetWare for DEC Access Q & A: Access via T1

**Due to logistics, we can't locate the NetWare for LAT server near the Digital machine it will be talking to. Can we connect the NetWare for LAT server via a T1 line?**

This configuration may be possible. Make sure you have LAT001.EXE applied to your copy of NetWare for LAT. As long as your T1 line is bridged between locations, you should be able to get this configuration to work. Having the LAT001 patch in place is required, due to timing modifications required for this type of installation.

# NetWare for DEC Access Procedure List

Installing From Diskette

Installing NetWare for LAT COMMEXEC from CDROM on Server

## NetWare for DEC Access Procedure: Installing NW4LAT COMMEXEC from CDROM on Server

1. Insert the NetWare for DEC Access CD-ROM into the server's CD-ROM drive.

2. Mount the CD-ROM as a NetWare volume (the volume name should be NWLAT).

3. At the server's console prompt, type LOAD INSTALL and press the Enter key.

4. Select Product Options.

5. Press the Insert key.

6. Type NWLAT:COMMEXEC/DISK1 and press the Enter key.

7. Select Install on this Server and press the Enter key.

8. Press Esc.

9. Press Esc.

10. The installation is now complete.

## NetWare for DEC Access Procedure: Installing From Diskette

1. Install the communications executive required for NetWare for DEC Access.

2. At the server console prompt, type LOAD INSTALL and press the Enter key.

3. Select Product Options and press the Enter key.

4. Press the Insert key.

5. Insert the first NetWare for DEC Access diskette into the drive and press the Enter key.

6. Insert additional disks as requested.

7. Exit the INSTALL.NLM when finished.

# NetWare for DEC Access Requirements

**Server requirements:**

- NetWare v3.x or 4.x

- Memory: 8 megabytes (MB) minimum

- Disk space: No significant requirements

- In heavy traffic situations, a dedicated adapter for DEC access should be used.

**Client requirements:**

- Requires workstation terminal emulator compatible with NetWare for LAT or NetWare for DEC Access

## NetWare IP/NFS



# CD HELPdesk Series: Novell Products

Click on any icon for more information

## NetWare IP/NFS Q & A

[Access to HP/9000](#)

[License Match with NetWare](#)

[Monitoring RS/6000 Volume Mounting](#)

[Name Space Mounting Is Slow](#)

[NetWare Flex/IP and NetWare 4.10](#)

[Permissions](#)

[Printing and Form Feeds](#)

[Upgrading to NetWare v3.12](#)

[Upgrading to NetWare 4.10 Using NetWare NFS 1.2c](#)

[VREPAIR after Server ABEND](#)

## NetWare IP/NFS Q & A: Name Space Mounting Is Slow

**We have noticed lately that it is taking 25 minutes or longer to mount a volume with the NFS name space. Is there any way that we can speed this up?**

Yes. Check that you have the latest drivers for your hard disk controller. It is not unusual for older drivers to cause this type of problem. Verify that you have the latest firmware on the controller as well. Check the block size you used when you created the volume. Although NetWare defaults to 4 kilobyte (KB) block sizes, NFS has a default of 8KB. The larger the block size you can use, the faster the volume will mount and the less memory the server will need to cache file information on the drive. When you select the block size for a volume on a NetWare v3.x server, the average file size should be a gauge for deciding how large a value you use. If you need to change the block size on a volume, you will have to back up the current volume to tape, delete and recreate the volume, and restore it from tape.

# NetWare for IP/NFS Q & A: VREPAIR after Server ABENDs

**Our server recently crashed, requiring us to run VREPAIR on several volumes before they could be mounted. V_NFS.NLM didn't automatically load as the directions said it would. What can I do?**

Make sure that V_NFS.NLM is in the same directory (SYS:SYSTEM) or same DOS partition (i.e., C:\SERVER.312) from which you load VREPAIR.NLM. In the event that V_NFS.NLM doesn't autoload, you can do the following to load it. At the console prompt, enter LOAD VREPAIR and press Enter. After VREPAIR loads, press the Alt-Esc keys at the server console, switch to the system console display, enter LOAD V_NFS, and press Enter. Return to the VREPAIR.NLM screen and run VREPAIR.

## NetWare for IP/NFS Q & A: Upgrading to NetWare v3.12

**I currently have NFS 1.2c installed on a NetWare v3.11 server. I am upgrading this server to NetWare v3.12. Is there anything I need to watch out for after the upgrade?**

No. NFS 1.2c should work fine with NetWare v3.12. As a precaution, you may want to download LIBUP5.EXE from NetWire and apply the latest CLIB.NLM to your NetWare v3.12 server.

## NetWare IP/NFS Q & A: Access to HP/9000

**I need to create a volume that resides on an HP/9000 and is available to the users on the LAN. What is the easiest way of doing this?**

Novell's NFS Gateway provides the ability to mount a UNIX volume and make it appear as a NetWare volume. In this manner, drives can be mapped as if the volumes resided on the NetWare server.

## NetWare IP/NFS Q & A: Upgrading to NetWare 4.10 and Using NetWare NFS 1.2c

**We will be upgrading our NetWare v3.x server to NetWare 4.10 soon. Will NetWare NFS 1.2c work on NetWare 4.10, or do we have to upgrade to NetWare NFS 2.1 first?**

No, NetWare NFS 1.2c will not work with NetWare 4.10. Versions of NFS 1.2c and earlier are not supported on NetWare 4.10, due to problems with file locking and other issues. You must use NFS Services 2.1 NetWare 4 Edition. You can first upgrade the server to NetWare 4.10 and then install NFS servers. Remember to REM out the loading of the NFS NetWare Loadable Modules (NLMs) prior to starting the upgrade process to keep them from loading after NetWare 4.10 has been installed.

# NetWare for IP/NFS Q & A: Monitoring RS/6000 Volume Mounting

**We are using NetWare NFS to mount a volume to an RS/6000. How can the status of the volume mounting be monitored from either the RS/6000 or the NetWare file server?**

From the RS/6000, you can use SMIT to monitor the progress of the volume mounting. Select Communications, NFS to follow the progress. From the NetWare console, use UNICON to accomplish the same thing.

## NetWare for IP/NFS Q & A: Permissions

**After mounting a server volume in NetWare NFS, I noticed that the file permissions are set to dr-x------. How can I make changes to the permissions so users on the UNIX box will be able to use the NetWare volume I exported?**

Load NFSADMIN on the NetWare server. Select File Permissions from the menu. You should be able to reset the directory flags at this point.

# NetWare IP/NFS Q & A: License Match with NetWare

**Our purchasing department purchased a 5-user license of NetWare NFS instead of one that matches our 100-user NetWare license. Can we use the lower user license count of NetWare NFS on the server, even though the licenses don't agree in user count?**

Yes, you can. You will be limited to five concurrent NetWare NFS users, but there shouldn't be any problems other than that.

## NetWare IP/NFS Q & A: Printing and Form Feeds

**We recently started sending print jobs to a laser printer attached to the UNIX box on our network. The last page of the print job isn't coming out and someone has to hit the Form Feed button on the laser printer to get it. How can we fix this?**

Load UNICON on the NetWare server that NetWare NFS is loaded on. Configure the print job in UNICON to add the needed form feed.

# NetWare IP/NFS Q & A: NetWare Flex/IP and NetWare 4.10

**Since upgrading to NetWare 4.10, we can't get NetWare Flex/IP to load. We bought NetWare Flex/IP instead of NetWare NFS because it costs less. What patches do we need to apply to get NetWare Flex/IP to load?**

Because of significant differences in the network operating system between NetWare v3.1 and NetWare 4.10, you will need to upgrade to UNIX Print Services. The benefits are that UNIX Print Services are NetWare Directory Services (NDS)-compliant and designed to work with NetWare 4.10. UNIX Print Services work in a similar fashion to NetWare Flex/IP. The main difference is that the file-sharing functions of NetWare Flex/IP have been removed. The installation of UNIX Print Services is a little different, and management is performed through a different console process. There have been some changes to the form feed and banner options. If the new defaults present a problem for you, you should be able to work around them by changing your print configuration in UNIX Print Services with the UNICON utility.

# NetWare IP/NFS Procedure List

[Installing the NetWare IP Client Software from Diskette](#)

[Installing NetWare IP on the Server (1st-time Installation)](#)

## NetWare IP/NFS Procedure: Installing NetWare IP on the Server (1st-time Installation)

1. At the server console prompt, type UNISTOP and press the Enter key to stop all services that may be using PKERNEL.NLM.

2. At the server console prompt, type LOAD INSTALL and press the Enter key.

3. Select Product Options and press the Enter key.

4. Select Install a Product Not Listed and press the Enter key.

5. Insert the first NetWare IP disk into the diskette drive and press the Enter key.

6. Accept the displayed host name and press the Enter key.

7. Accept the default of C and press the Enter key.

8. Select Y to install the online documentation.

9. Insert additional diskettes as requested.

10. Select Yes to configure NetWare IP and press the Enter key.

11. Select Configure DNS Client and press the Enter key.

12. Type the name of the DNS domain this server will reside in and press the Enter key.

13. Type the IP address of the DNS server in Step 12 and press the Enter key.

14. Press Esc.

15. Select Configure NetWare IP Server and press the Enter key.

16. Type the NetWare IP server domain name and press the Enter key.

17. If the NetWare IP server will be acting as a forwarding gateway, highlight the Forward IPX Info field, press the Enter key and press Y.

18. Press Esc.

19. Select Y to save the configuration information entered.

20. Select Start NetWare IP Server and press the Enter key.

21. Press Esc.

22. Press Esc.

23. Press Y and the Enter key to continue.

24. Press Esc.

25. Press Esc.

26. Press Esc.

27. Press Y and the Enter key.

28. At the server console prompt, type DOWN and press the Enter key.

29. At the server console prompt, type RESTART SERVER and press the Enter key.

## NetWare IP/NFS Procedure: Installing the NetWare IP Client Software from Diskette

1. Verify that the DOS SHARE command is not loaded during the installation process.

2. Insert the NetWare IP WSDOS_1 diskette into the diskette drive.

3. Change to the diskette drive.

4. Type INSTALL and press the Enter key.

5. Accept the default install directory, press the Down Arrow key.

6. Accept the install Program Modifying System Files, press the Down Arrow key.

7. Accept the Enabling of Microsoft Windows Support, press the Down Arrow key.

8. Accept the Default Location of Windows, press the Down Arrow key.

9. Accept the default of not using SMS for workstation backup, press the Down Arrow key.

10. Press the Enter key to confirm the board driver to install for the workstations.

11. Press the Enter key to continue.

12. Accept the default TCP/IP directory, press the Down Arrow key.

13. Press the Down Arrow key to accept not using BOOTP.

14. Type the IP address of this workstation and press the Enter key.

15. Type the subnet mask and press the Enter key.

16. Type the IP address of the default router and press the Enter key.

17. Type the DNS domain name and press the Enter key.

18. Type the IP address of the DNS server in Step 17 and press the Enter key.

19. Type the IP addresses of the second and/or third DNS servers and press the Enter key.

20. Accept the default of not using extended BOOTP and press the Down Arrow key.

21. Type the IP domain name and press the Enter key.

22. Type the hostname, IP address, subnet mask for up to five of the nearest DSS servers for this workstation and press the Enter key after each entry.

23. Type the hostname, IP address and subnet mask for up to five of the nearest NetWare IP servers for this workstation and press the Enter key after each.

24. Press Esc to save the configuration.

25. Press the Enter key to install the IP client software.

# NetWare IP/NFS Requirements

**Server requirements for NFS:**

- NetWare v3.x or NetWare 4.x

- Free disk space required: 3.0 megabytes (MB)

- RAM Required: 5 megabytes (MB)

## NetWare IP/NFS Utilities

[CompuServe NetLauncher](#)

[TCPRINT--Host TCP/IP Printer Server for NetWare](#)

## NetWare IP/NFS Utility: TCPRINT--Host TCP/IP Printer Server for NetWare

TCPrint is a printer server that resides on a NetWare file server and complies with the RFC1179 protocol for a Line Printer Daemon (LPD).

All hosts that support the TCP/IP LPD protocol can assign their print jobs into the NetWare server's print queues directly via TCPrint. There is no additional software required for those hosts.

Users can assign their jobs transparently just as if they are printing on host. All processes will be done by host and TCPrint.

Also, TCPrint performs UNIX to DOS ASCII text translation automatically.

It also provides LPQ and LPRM commands. Some UNIX systems didn't interpret job status data more than two lines long when the LPQ command was issued. Please contact the author if this situation occurs. This version has been tested for NetWare v3.x and 4.x. It doesn't need too much expertise for installation.

To install it, copy the D:\PROGRAMS\TCPRINT directory to your hard disk.

Please read the README.DOC file for more information.

## NetWare IP/NFS Utility: CompuServe NetLauncher

NetLauncher is Internet access software for CompuServe.

To install this software, copy the directory D:\PROGRAMS\NETLAUNC to your hard disk. Then run the SETUP program from the Windows Program Manager File Run command line. If your CD-ROM drive is designated as drive D, type D:\NETLAUNC\SETUP.EXE and choose OK.

# NetWare for Macintosh



**CD HELPdesk Series: Novell Products**

Click on any icon for more information

Q+A

PROCEDURE LIST

REQUIRED

VENDOR LIST

## NetWare for Macintosh Q & A

## NetWare for Macintosh Q & A: Macintosh Fatal Error and Logging In

**We installed NetWare for Macintosh v3.12. None of the Macintoshes can log into the NetWare network. Sometimes a "Macintosh fatal error 1072" will be received; at other times, no message is displayed. What do we need to look for?**

On the v3.12 server, put the following SET statement in the AUTOEXEC.NCF file immediately following the PBURST: Set NCP packet signature option = 0. Be sure to set Allow Unencrypted Passwords to ON in the AUTOEXEC.NCF file as well.

There are updates to NetWare for Macintosh v3.12 that should be applied. They are NAM312.EXE and AFP11.EXE, and can be found in NOVLIB Section 8 on NetWire. It is also a good idea to make sure you have the newest LAN drivers installed for the network adapters in your server.

## NetWare for Macintosh Q & A: Logging In Error after a Server ABENDS

**Our NetWare 4.10 server crashed last week and we had to restore it from backup tapes. Since restoration, the Macintoshes can't see the server. When they try to log in, they receive this message: "This file server does not use a recognizable logon sequence." How do we fix it?**

Download LANDR4.EXE from NetWire and apply the latest MSM.NLM and the appropriate topology support manager (TSM) (i.e., ETHERTSM.NLM or TOKENTSM.NLM). Then get the newest LAN driver for the network adapter in the server. If your server is a Compaq or uses a Compaq network adapter, download SP1212.EXE from the Compaq forum (GO COMPAQ) on CompuServe.

There may be a problem with the users' passwords on the server. Load AFPCON on the server, select Detailed Configuration, and select User Access Information. Change the Allow Clear Text Password login to YES. This step shouldn't have to be performed if you have the MACNDS client, but it can be a good troubleshooting step to see if the client software is causing the problem.

## NetWare for Macintosh Q & A: NetWare for Macintosh v3.12 and NetWare v3.11 Compatibility

**We have a copy of NetWare for Macintosh v3.12 that we would like to load on a NetWare v3.11 server. Is this possible?**

Yes. You shouldn't have a problem as long as you take a few precautions. Apply LIBUP5.EXE for the latest CLIB.NLM and get the newest LAN drivers for the server. This will help prevent some Macintosh-related communications problems caused by older LAN drivers. Put the following SET command in the AUTOEXEC.NCF file on the server: SET MAXIMUM ALLOC SHORT TERM MEMORY=8000000. This setting assumes you have at least 16 megabytes (MB) of memory in the server. Your cache buffers figure in MONITOR should be 70-80 percent with NetWare for Macintosh loaded. For every 1 gigabyte (GB) of hard drive space on the server, you ideally should have 16MB of RAM.

## NetWare for Macintosh Q & A: Trouble Seeing the NetWare 4.10 Server

**We have just installed a NetWare 4.10 server with NetWare for Macintosh. All the Macintoshes can see the NetWare v3.x servers on our internetwork but not the NetWare 4.10 server. Do I need to install the new Macintosh client for them to see both types of servers? I tried to transfer the MACNDS.SEA file to a Power Macintosh via a disk created on a PC, but I had no luck.**

 Your problem started when you tried to transfer the .SEA file to the Macintosh via a PC. The MACNDS.SEA file was uploaded with MacBinary headers, and transferring it to a Macintosh via a PC corrupted the headers.

The first thing to check is the bindery context statement set on the NetWare 4.10 server. If this isn't set, that is the problem. Existing Macintosh client software should be able to see a NetWare 4.10 server as a bindery client.

# NetWare for Macintosh Q & A: Error While Loading AFP.NLM

**When starting the server, I get an error while loading AFP.NLM: "Desktop files are invalid or damaged, Volume is unavailable, etc." How can I fix it so that Macintoshes can access the volumes again?**

At the server's console prompt (:), unload AFP.NLM. Enter the following command after that: LOAD AFT CDT. This will rebuild the desktop files for the Macintosh.

# NetWare for Macintosh Q & A: Differences between v.3x and 4.10

**I am getting ready to upgrade a server that has NetWare for Macintosh installed from NetWare v3.x to 4.10. What configuration differences are involved?**

The main difference is that NetWare 4.10's NetWare for Macintosh is configured by using INETCFG.NLM. Since INETCFG is menu-driven, you won't have to worry about getting the syntax correct when loading the LAN drivers. Before starting, review the online documentation that comes with the NetWare 4.10 server. Look for the book that covers installing and maintaining NetWare for Macintosh.

# NetWare for Macintosh Q & A: WordPerfect, Excel, and Word Files with Wrong Create and Modify Dates

**We have been noticing a problem with files created or modified using WordPerfect for Macintosh. The problem has shown up intermittently using Excel and Word for Macintosh, as well. The file date and time stamps we are seeing when the file is created or modified are Fri., Sep. 19, 2008 8:23 am. This problem is showing up more often. Do we need to apply patches to NetWare for Macintosh?**

Applying the latest patches to NetWare for Macintosh shouldn't hurt, but your problem doesn't appear to be operating-system-related. The problem you describe has been reported by other WordPerfect for Macintosh users. Contact WordPerfect technical support at (800) 228-2875 or use the WPMAC forum on CompuServe to download patch files that will fix the problem.

## NetWare for Macintosh Q & A: Printers Disappear after the Server ABEND

**We have noticed lately that if our server abends (which doesn't happen very often), some of the Macintosh printers don't show up in the Chooser. Running VREPAIR and rebooting the Macintoshes doesn't seem to help. The Macintoshes can log in and get file access but can't use printers. Do you have any idea how to fix this?**

It could be a bindery-related problem. Try running BINDFIX from a DOS workstation and see if the problem clears up. The next thing to try is deleting the Macintosh print queues using PCONSOLE. After unloading and loading ATPS (which will recreate the desired queues), the problem should be fixed. If you are using ATPS as the print server, you might need to repeat the process for the ATPS_PSERVER object in the binderies as well. In this case, after deleting the object and before reloading ATPS, run BINDFIX to flush the deleted information from the binderies.

## NetWare for Macintosh Q & A: LOAD Statements Don't Work after Adapter Change

**I replaced the network adapter in the server and used INETCFG to reflect the changed adapter. Since making the change, I've noticed the LOAD statements for the adapter aren't being used. If I manually enter the LOAD and BIND statements, NetWare for Macintosh works properly. I shouldn't have to do this, should I?**

Download INTCFG.EXE from NOVLIB, Library 14 on CompuServe. This is a new version of INETCFG that will work with more LAN adapters than the version you have. It would also be a good idea to get the newest LAN drivers for the adapters you are using. Make sure that when you copy the NEW.LAN file to the SYS:SYTEM directory, you also copy the corresponding .LDI file.

# NetWare for Macintosh Q & A: VREPAIR Errors after Drive Change

**After a drive failed on the server, I had to run VREPAIR. I tried loading V_MAC.NLM to repair the Macintosh name space, but received several error messages indicating "Loader cannot find public symbol." I haven't been able to locate a newer V_MAC.NLM. Am I doing something wrong?**

VREPAIR needs to be loaded before V_MAC.NLM can be loaded. If you are loading VREPAIR from the DOS boot area on your hard drive or disk drive, make sure that a copy of V_MAC.NLM resides there as well. It should autoload. If V_MAC.NLM doesn't autoload when you load VREPAIR, return to the console prompt, load V_MAC.NLM, and then return to the VREPAIR screen.

# NetWare for Macintosh Procedure List

[Adding MAC Name Space](#)

[Installing Macintosh Support--NetWare 3.12](#)

## NetWare for Macintosh Procedure: Adding MAC Name Space

1. Make sure you have enough memory to add the Macintosh name space by meeting the minimum system requirements for this product.

2. At the server console prompt type LOAD MAC.

3. At the server console prompt type ADD NAME SPACE MACINTOSH TO SYS.

4. Make sure the MAC.NAM file is present in the DOS boot partition.

## NetWare for Macintosh Procedure: Installing Macintosh support-- NetWare 3.12

1. Make sure your systems meet the minimum requirements to run this product. (See Page 3 of the *Novell Appletalk Support Package Installation and Maintenance* manual).

2. Read "A Note About AppleTalk Networks" (On Page 5, *Novell Appletalk Support Package Installation and Maintenance* manual).

3. An especially important tip: Experience has shown that it is not advisable to have NetWare servers perform routing for Appletalk networks greater than 1,500 nodes. Contact Apple Computers for more information.

4. At the NetWare server load the INSTALL utility by typing LOAD INSTALL.

5. Select Product Options.

6. Insert the diskette NW-ATALK in the server's diskette drive.

7. Press the Insert key.

8. Press the Enter key.

9. Enter the path for the STARTUP.NCF" file and press the Enter key.

10. Select Install NW-ATALK.

11. Select STARTUP.NCF.

12. Add SET MINIMUM PACKET RECEIVE BUFFERS=100".

13. Press Esc.

14. Select Yes.

15. Select AUTOEXEC.NCF.

16. Add Lines:

17. Load APPLETALK NET=55001(Net number) ZONE={"Server Zone"}

18. Load (your network driver) frame=ETHERNET_SNAP.

19. Bind AppleTalk to your adapter: NET=220 ZONE={"Mac Zone"}.

20. Exit INSTALL.

21. Select Save Changes.

22. At the server console prompt type DOWN.

23. At the server console prompt type EXIT.

24. Restart the server by typing SERVER.

## NetWare for Macintosh Requirements

**Server requirements:**

- NetWare v3.x or 4.x

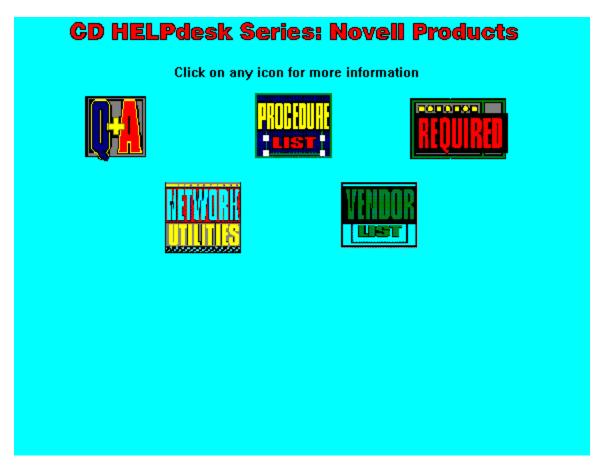- Memory: 5 megabytes (MB) minimum for 5-user version, 8MB minimum for 200-user version

- Disk space: No significant requirements

- Must have the latest version of LAN driver for the adapter in the server to properly handle AppleTalk Phase I and Phase II

**Macintosh client requirements:**

- AppleShare workstation software v2.0 or later

- Macintosh Operating System 6.x or 7.x

## ManageWise

## ManageWise Q & A

[Logging In as Netman](#)

[Managing 3Com's ECS Management Card](#)

[NetMan Password Problem](#)

[ManageWise and SFT Level III](#)

[Server ABENDs Involving LANZHIS or LPROTECT](#)

[Timercritical=10000 Statement and Windows for Workgroups](#)

[Use of LANDesk Manager v2.0 with ManageWise](#)

[USER.COM Error and Serialization of LANSight](#)

[Virus Protecting a Second Server](#)

## ManageWise Q & A: Use of LANDesk Manager v2.0 with ManageWise

**I have just purchased ManageWise. Reading some of the computer magazines, I see that Intel has released LANDesk Manager v2.0. Can I use this with ManageWise?**

Yes. The first thing to do is install ManageWise and get it working. Install LANDesk Manager v2.0 after that. You can upgrade to LANDesk Manager v2.5 from version 2.0 for less than $10 per user. It still snaps in to ManageWise.

# ManageWise Q & A: Managing 3Com's ECS Management Card

**We are using 3Com's LinkBuilder products throughout our network. The hub we are using has the ECS Management Card installed. Can we manage this card from within ManageWise?**

ManageWise will see and talk to the 3Com hub using a Simple Network Management Protocol browser. For additional functionality, you will need to purchase the 3Com Router Manager snap-in module from StonyBrook Services or look at 3Com's Transcend for NMS to see if it supports your hardware.

## ManageWise Q & A: Timercritical=10000 Statement and Windows for Workgroups

**During ManageWise installation, I was advised to modify my Windows for Workgroups SYSTEM.INI file and add the statement Timercritical=10000. Windows for Workgroups now advises me that this statement will result in an unstable environment. How can I keep Windows for Workgroups and ManageWise happy in this configuration?**

You should leave that statement in place for best results with ManageWise. No problems have been reported by users who have left it in. If you do see problems, you can try removing the statement, but it could cause problems with ManageWise.

## ManageWise Q & A: NetMan Password Problem

**I recently installed ManageWise on the servers in our network. Something has happened to the NetMan password. Each time I try to install ManageWise on one of the new servers, I get an error message that the password is wrong. To simplify management, I use the same password for NetMan and ManageWise console operations. How can I change the password?**

Try checking the exact case (i.e., upper- and lower-case letters) that you entered for the password initially. The password is case-sensitive. The only option you have if you can't get in with the password you think you used is to delete and reinstall ManageWise. For security reasons, it would be better if you used separate passwords for the NetMan and console logins for ManageWise.

# ManageWise Q & A: Logging In as NetMan

**I noticed during ManageWise installation a login ID of NetMan was created. What is this ID and should I be concerned about it?**

The NetMan login ID is used by the ManageWise console whenever you double-click on a server icon requesting detailed information about that server.

# ManageWise Q & A: Virus Protecting a Second Server

**I have finished installing a 250-user ManageWise application into a NetWare v2.x network. Everything is fine with the first server. What do we need to do to have virus protection on the second server?**

The license that comes with LANDesk Virus Protect in the ManageWise bundle is for one server only. You will need to purchase an additional LANDesk Virus Protect license from Intel.

## ManageWise Q & A: Server ABENDs Involving LANZHIS or LPROTECT



**Since installing ManageWise I have experienced several server abends. The server had not abended at all prior to the installation. Most of the abends involve page faults and mention the LANZHIS or LPROTECT processes. The server is using Adaptec 2940 and Intel Pro PCI adapters. Do you have any suggestions about what to look for?**



Looking at the Adaptec PCI adapters would be worthwhile. Adaptec has recently updated both the firmware on the 2940 adapters and the drivers for them. Download the NW41X.EXE file from Adaptec's bulletin board service. Check with Adaptec technical support to see if you have the latest firmware. Depending on the chipset on your motherboard that communicates with the PCI adapters, you might have a compatibility issue to contend with. Try using another brand of PCI hard disk controllers, such as the Buslogic 946, to see if the problem still exists. You might have to resort to using an EISA-style hard drive controller.

# ManageWise Q & A: USER.COM Error and Serialization of LANSight



**Users on one of my servers report that when they try to run USER.COM, they receive an error message that the server they are on is not serialized to run LANSight. I have purchased additional NetWare Management Services (NMS) agents for the server. Why are users receiving this message and what can I do?**



ManageWise is licensed for each server by the user count on that server. Purchasing the NMS agents alone does not license you to use the LANDesk components on that server. You will need to buy a copy of ManageWise for each server.

## ManageWise Q & A: ManageWise and SFT Level III

**I have installed ManageWise on a NetWare 4.10 SFT Level III server. Several of the NetWare Loadable Modules (NLM) cannot find functions or public symbols they need to load. The LANDesk USER.NLM responds with the message "Module doesn't work on SFT III servers." Do I need to load the modules a different way to get them to work?**

The NetWare Management Services (NMS) portion of ManageWise doesn't support SFT Level III at this time. The Product Development Group at Novell responsible for this product is aware of the problem and is working on a resolution.

# ManageWise Procedure List

[Installing ManageWise](#)

[Restricting IPX Discovery](#)

## ManageWise Procedure: Installing ManageWise

1. Insert the ManageWise CD-ROM into CD-ROM drive and the ManageWise diskette into the diskette drive.

2. From Windows, select Alt-F, Run.

3. Enter D:SETUP (in which D: is the CD-ROM drive designation of the local CD-ROM drive or the drive mapped to the server's CD-ROM drive) and press the Enter key.

4. Select the Setup Server option and press the Enter key.

5. In the ManageWise Target Server Installation dialog box, select a drive letter that is mapped to the SYS: volume and client on the Install button, or press the Enter key to proceed.

6. In the NetExplorer dialog box, if this is the first server ManageWise is being installed on, click on the box beside Install NetExplorer on this Server and then click on Continue.

7. When presented with the NetMan password box, select a password that will be unique for this login ID, enter it and click on Continue.

8. If you are presented with an Incompatible Files dialog box, this is to alert you to potential problems with using outdated files. If the date and time stamp of the file(s) in question are more current in the On your System column than on the On Product Disks column, click on the OK button. This will prevent the replacement of the file(s) with the earlier dates.

9. When the installation proceeds to the LANDesk Manager Tools Setup, you will be presented with a ManageWise Server Changes dialog box. Click on the Accept button to proceed.

10. You will next be presented with the LANDesk Virus Protect Setup dialog box; click on Accept and press the Enter key.

11. When the installation is complete, review, and print the server To Do list.

12. Select Set Up Console from the ManageWise Setup screen and press the Enter key.

13. From the ManageWise Console Setup dialog box, select the local installation path for the ManageWise Console, the network drive letter where ManageWise is

installed on the server, and click on Install to proceed.

14. From the NetWise Size dialog box, click on the selection that represents the size of your network and click on OK to continue.

15. Enter your name and company name in the registration dialog box and click on Continue.

16. Click on the YES button in the User Registration box.

17. Confirm the name of the server that is listed in the ManageWise Setup box, change it if needed, and click on the OK button.

18. Click on the TCP/IP Option in the Desired Options dialog box if your network uses TCP/IP.

19. Click on OK to proceed.

20. Click on OK in the Choose Desired Options box to allow for updating of needed configuration files.

21. Click on Yes in the Question dialog box to allow for shutdown of NMS (in case it happens to be running).

22. Watch for Critical Error dialog boxes that may be displayed during installation. Record the messages you receive. This is usually an indication that a file the installation routine is trying to replace has been flagged read-only. If this happens, you will need to reflag the file to RW and restart the installation.

23. Select the Correct Time Zone for your installation and if your area uses daylight savings time and click on OK.

24. Review the changes proposed in the ManageWise Console Changes dialog box and click on ACCEPT.

25. Review and/or print out the Console-to-do List and click on done.

# ManageWise Procedure: Restricting IPX Discovery

1. Identify the IPX network numbers that you wish to restrict the discovery process to.

2. Using a DOS editor, edit the NXPIPX.INI file that resides in the SYS:NMDISK directory.

3. Add the line: IPXQNST=XXXXXXXX (in which X is the eight-digit IPX network number you want to restrict discovery to) at the bottom of the file.

4. Repeat Step 3 for each additional IPX network that you want to restrict discovery to.

5. Save the file and exit to DOS.

6. At the server console, type UNXP at the console prompt and press the Enter key.

7. Type NETXPLOR and press the Enter key to reload ManageWise.

## ManageWise Required

**Server requirements:**

- Version of ManageWise that matches the license count of the server

- Free disk space required: 200 megabytes

- RAM Required: 8 to 10 megabytes

**Management console requirements:**

- RAM: 12 megabytes

- Free disk space required: 40 to 80 megabytes

**Client requirements:**

- 0 to 11KB of system memory for TSRs

- DOS 3.3 or later

## ManageWise Utilities

AuditTrack v2.04 by On Technology (Free 30-Day Trial)

AuditWare from Preferred Systems

BrightWorks from McAfee

Close-Up/LAN Pro v6.1 from Norton-Lambert

Common Knowledge by On Technology (Free 30-Day Trial)

DaVinci eMAIL by On Technology (Free 30-Day Trial)

DS Standard from Preferred Systems

John T. McCann's SofTrack by On Technology(Free 30-day Trial) .

LAN Inventory from McAfee

LAN Support Center from McAfee

Meeting Maker XP Cross Platform Group Scheduler (Free 30-day Trial) from On Technology

NetShield from McAfee

NetTools from McAfee

NetTunePRO from HawkNet

Notework Electronic Mail by On Technology (Free 30-Day Trial)

SiteExpress from McAfee

SiteMeter from McAfee

Software Sentry by Microsystems Software

## ManageWise Utility: DS Standard from Preferred Systems

Powerful Daily NDS Management with a Safety Net

DS Standard NDS Manager is a Windows-based, off-line NDS management tool. Using DS Standard, network managers make changes to a back-end database, not the "live" network.   With its powerful database capabilities, DS Standard reduces the time required to manage NDS, makes migrations as easy as drag-and-drop, and with over 100,000 copies in distribution, DS Standard is the premier NDS management tool available today!

To run DS Standard NDS Manager, copy the directory \PROGRAMS\PSI\DSINST to your hard disk. Then use the File Run option in Windows. Type SETUP.

Your DS Standard NDS Manager license expires on (January 15, 1996).   To purchase a copy of DS Standard software, or to renew this license, please contact your PSI representative at (203) 937-3000.

Thank you for your interest in software from Preferred Systems, Inc.!

## ManageWise Utility: AuditWare from Preferred Systems

Automated Reporting Tools for the Enterprise

AuditWare is a Windows-based reporting tool for Novell NetWare.   It is the first available tool that provides true multi-server support.   And since configurations are captured to a database, it alleviates network degradation caused by most other reporting tools.   A Windows-based custom report writer enable exception reporting, and AuditWare's extensible architecture allows external databases to be linked into any report.

Your AuditWare license expires on (January 15, 1996).   To purchase a copy of AuditWare software, or to renew this license, please contact your PSI representative at (203) 937-3000.

Thank you for your interest in software from Preferred Systems, Inc.!

To install AuditWare, copy the directory \PROGRAMS\PSI\AUDIT to your hard disk, and choose the File Run option in Windows. Type in SETUP.

# Managewise Utility: Software Sentry by Microsystems Software

Software Sentry from Microsystems Software Inc. Is a license metering and software asset management package for any network, including NetWare.

To install Software Sentry, copy the subdirectory \PROGRAMS\MICROSYS to your hard disk. From the File Run command, type SETUP.

## Managewise Utility: AuditTrack v2.04 by On Technology (Free 30-Day Trial)



AuditTrack v2, a NetWare network auditing product, is a network surveillance system that allows LAN administrators to track and identify all login, file, remote access and bindery activity occurring anywhere on a NetWare network.

To install this software, copy the directory D:\PROGRAMS\\AUDITTR to your hard disk. Then run the SETUP program from the Windows Program Manager File Run command line. If your hard drive is designated as drive C, type C:\AUDITTR\SETUP.EXE and choose OK.

## Managewise Utility: BrightWorks from McAfee

BrightWorks 2.0, an integrated enterprise network management suite for NetWare 3.x and 4.x networks, includes server monitoring, server performance tuning, help desk, and advanced scripting modules, as well as enterprise metering, inventory, and software distribution capabilities.

To install this software, copy the directory D:\PROGRAMS\MCAFEE\BWORKS to your hard disk. Then run the SETUP program from the Windows Program Manager File Run command. If your hard drive is designated as drive C, type C:\MCAFEE\BWORKS\SETUP.EXE and choose OK.

# Managewise Utility: Close-Up/LAN Pro v6.1 from Norton-Lambert

This evaluation is a timed evaluation that includes two fully running programs; the Close-Up modem remote communications package and the Close-Up LAN Pro network remote communications package. Users can demo the Close-Up modem product, the Close-Up/LAN Pro network product, or both products simultaneously.

A README file is included that is a quick manual and reference guide for operating both Close-Up and Close-Up/LAN Pro modem and network programs.

**Requirements:**

- Hardware: IBM PCs, ATs, XTs, PS/2s, and 100% compatibles.
- Operating System: MS or PC DOS 3.3 or later.
- Windows (Optional): Windows 3.1 or 3.11. Windows for Workgroups 3.11.
- Mouse (optional): Microsoft mouse and 100 percent compatibles
- Network (optional): NetWare and all popular networks
- Modems: Point and Select from over 800 modems
- Monitors: Monochrome through SVGA
- Memory: Close-Up Host 0K (with UMB's) or 42KB, remote 375KB
  Close-Up/LAN Pro Host 0K (with UMB's) or 47KB, remote 375KB
- Hard disk: Recommended
- **Note**: Requires 2 machines to establish a remote connection

To install, copy the directory D:\PROGRAMS\NORTON to your hard disk. Type CINSTALL at the DOS prompt.

## Managewise Utility: Common Knowledge by On Technology (Free 30-Day Trial)



Common Knowledge, a collaborative groupware product for sharing information and documents, allows users to create, access, edit, distribute, and share information over a network while providing a structure for managing and tracking the input of workgroup participants.

To install this software, copy the directory D:\PROGRAMS\COMMON to your hard disk. Then run the SETUP program from the Windows Program Manager File Run command line. If your hard drive is designated as drive C, type C:\COMMON\SETUP.EXE and choose OK.

## Managewise Utility: DaVinci eMAIL by On Technology (Free 30-Day Trial)

DaVinci eMAIL includes NetWare Directory Services (NDS) support as well as NetWare MHS-based electronic mail capability for DOS, Windows and Macintosh environments.

Installation:

1. Log in as "ADMIN" on a 386 or higher PC-compatible workstation with at least 2 MB of RAM and DOS 3.3 or higher.

If you do not have an ADMIN user name with supervisory rights on the network, you can use any user name that has supervisor equivalence.

2. Run Windows.

3. Select RUN from the File menu.

4. Click on the Browse button to select the drive that contain the subdirectory containing the files you copied from the CD-ROM, then select SETUP.EXE and click on OK.

   Example: C:\DAVINCI\SETUPWIN.EXE

5. Click on the OK button.

6. Read the introduction at the bottom of the Setup screen, then click on the Install DaVinci eMAIL button.

7. Click on the Browse button if you wish to change the eMAIL installation.

Specify a different location for the new eMAIL installation, including the name of the directory for eMAIL itself.

   Example: M:\PUBLIC\DAVINCI

Note: Make sure the path you specify is accessible to all your users; all users should have a drive mapped to that SERVER/VOLUME. Use a drive letter and a complete path syntax for the installation, not server/volume syntax. The Browse feature will help you avoid typos and incorrect syntax.

8. Click on the OK button.

The SETUP program will display the Disk Space Required to install the eMAIL program and its files.

9. Click on the Install button to continue.

Follow the instructions on the screen while the SETUP program installs eMAIL.

After SETUP finishes, you will be returned to the Windows Program Manager for a few seconds as SETUP closes and ADMIN loads.

## Managewise Utility: John T. McCann's SofTrack By On Technology Corp. (Free 30-day Trial)



SofTrack, a software metering package, includes native support for Novell's NetWare Directory Services (NDS).

To install this software, copy the directory D:\PROGRAMS\SOFTRACK to your hard disk. Then run the INSTALL program from the Windows Program Manager File Run command line. If your hard drive is designated as drive C, type C:\SOFTRACK\INSTALL.EXE and choose OK.

## Managewise Utility: LAN Inventory from McAfee

BrightWorks LAN Inventory automates the collection, consolidation, analysis, and reporting of LAN asset information and provides support for Compaq's Intelligent Manageability strategy, as well as distributed PC assets.

To install this software, copy the directory D:\PROGRAMS\MCAFEE\LANINV and D:\PROGRAMS\MCAFEE\HELP to your hard disk. Then run the SETUP program from the Windows Program Manager File Run command line. If your hard drive is designated as drive C, type C:\LANINV\SETUP.EXE and choose OK.

## Managewise Utility: LAN Support Center from McAfee



LAN Support Center, a help desk package, helps administrators automate the collection, tracking and analysis of end-user support requests.

To install this software, copy the directory D:\PROGRAMS\MCAFEE\LANSUP and the subdirectories under it to your hard disk. Then run the SETUP program from the Windows Program Manager File Run command line. If your hard drive is designated as drive C, type C:\LANSUP\SETUP.EXE and choose OK.

## Managewise Utility: Meeting Maker XP Cross Platform Group Scheduler by On Technology Corp. (Free 30-Day Trial)

Meeting Maker XP, group scheduling software, includes LAN and Internet support, as well as other e-mail integration features.

To install this software, copy the directory D:\PROGRAMS\MEETING to your hard disk. Then run the SETUP program from the Windows Program Manager File Run command line. If your hard drive is designated as drive C, type C:\MEETING\SETUP.EXE and choose OK.

## Managewise Utility: NetShield from McAfee



NetShield 2.2 for NetWare, an anti-virus package for DOS, Windows and OS/2. The new releases includes Novell NetWare 4.1 support, enhanced notification options, a Windows console, administrator access controls, and increased scanning and detection performance.

To install this software, copy the directory D:\PROGRAMS\MCAFEE\NSH to your hard disk. Then run the SETUP program from the Windows Program Manager File Run command line. If your hard drive is designated as drive C, type C:\MCAFEE\NSH\SETUP.EXE and choose OK.

## Managewise Utility: NetTools from McAfee



NetTools, a Windows Desktop Management solution, includes global management capabilities and NDS support, as well as, menu administration, print management, software distribution and workstation security.

To install this software, copy the directory D:\PROGRAMS\MCAFEE\NTOOLS to your hard disk. Then run the SETUP program from the Windows Program Manager File Run command line. If your hard drive is designated as drive C, type C:\NTOOLS\SETUPM.EXE and choose OK.

## Managewise Utility: NetTunePRO from HawkNet

NetTune PRO is performance tuning and monitoring software for NetWare 4.1.

You can receive an evaluation of this product from HawkNet's World Wide Web site at http://www.hawknet.com/~netinfo.

## Managewise Utility: Notework Electronic Mail by On Technology (Free 30-Day Trial)

Notework Electronic Mail includes support for Macintosh, Windows NT, DOS, and Windows 3.1 clients.

To install this software, copy the directory D:\PROGRAMS\NOTEWORK to your hard disk. Then run the INSTALL.BAT file from the Windows Program Manager File Run command line. If your hard drive is designated as drive C, type C:\NOTEWORK\INSTALL.BAT and choose OK.

## Managewise Utility: SiteExpress from McAfee

SiteExpress is an Electronic Software Distribution package that contains enterprise software distribution capabilities, as well as management reports

To install this software, copy the directory D:\PROGRAMS\MCAFEE\SITEXP to your hard disk. Then run the SETUP program from the Windows Program Manager File Run command line. If your hard drive is designated as drive C, type C:\SITEXP\SETUP.EXE and choose OK.

## Managewise Utility: SiteMeter from McAfee

SiteMeter is an enterprise-wide software metering tool that supports global reporting of application license compliance and usage as well as consolidation of reporting of metering data from multiple servers and locations and anti-virus functions.

To install this software, copy the directory D:\PROGRAMS\MCAFEE\SITEMTER and the subdirectories below it to your hard disk. Then run the SETUP program from the Windows Program Manager File Run command line. If your hard drive is designated as drive C, type C:\SITEMTER\SETUP.EXE and choose OK.

## LANalyzer



**CD HELPdesk Series: Novell Products**

Click on any icon for more information

## LANalyzer Q & A

# LANalyzer Q & A: Character "~" in Usernames

**When running LANanalyzer for Windows, some of the usernames show as JSmith~5. What does the "~" character mean after the user name?**

When LANalyzer for Windows encounters the same user name more than once, it starts numbering them. The user names you mention should have a number following the "~". The number indicates the number of user names it has found so far in its search.

# LANalyzer Q & A: Monitoring Beaconing Token-Ring Networks

**One of our token-ring networks started beaconing recently and we thought this was a good time to put LANalyzer for Windows to the test. The workstation containing LANalyzer for Windows would not insert itself into the ring. How can we use LANalyzer for Windows to troubleshoot the ring then it won't insert itself into the network?**

By design LANalyzer for Windows won't insert into a beaconing network. The reason for this is that it felt you dont want a new network node (running LANalyzer for Windows or anything else) to insert into the beaconing ring. When a ring is beaconing, it has sensed a problem and is trying to fix it before allowing any new workstations to come in. In situation, you need a hardware-based network analyzer to get past this problem and be able to watch the network.

## LANalyzer Q & A: Exacting Performance Increases from LANalyzer for Windows

**What can I do to increase the performance of LANalyzer for Windows?**

Make sure you have the latest client files (LSL.COM and IPXODI.COM) on the workstation that is running LANalyzer for Windows. Check with the manufacturer of your network adapter to see that you also have the latest LAN driver. Make sure that no terminate-and-stay-resident programs (TSRs) except those required for LANalyzer for NetWare are loaded, as they may conflict. Don't run any other programs when you are using LANalyzer for Windows, to give it full access to the local CPU. If you don't have any Macintoshes on your network, don't load APPLE.COM.

## LANalyzer Q & A: Token-Ring Bridged Networks

**LANalyzer for Windows shows that my token-ring workstations are bridged. I don't have a bridge on the network or more than one adapter in the server. How do I fix this?**

Download the updates to LANalyzer for Windows from NetWire and apply the VCRAFT.386 file. This corrects the incorrect reporting of bridged workstations.

# LANalyzer Q & A: Users at Different Workstations and Capturing

**We have users that may use several different workstations in the course of a day. This causes some confusion when we try to track problems, as each time we run Capture Names in LANalyzer for Windows, the user names move. Is there any way to lock certain names to certain Media Access Control (MAC) network adapter addresses?**

Editing the LANalyzer for Windows.INI file and placing those names in the [Permanent Address] section should help the problem. This will help you keep the correct names with the right workstations each time you start LANalyzer for Windows.

# LANalyzer Q & A: Increasing the Size of the Capture Buffer

**I have been trying to track down a problem on the LAN using LANalyzer for Windows. Due to the type of transaction involved, I have had to resort to filtering to reduce the number of packets that are captured. Around the 1,000-packet mark, I seem to stop capturing packets or newer packets start to overwrite older ones. How can I increase the amount of memory in the capture buffer?**

LANalyzer for Windows is memory-intensive. Eight megabytes (MB) of RAM will hold approximately 1,400-2,000 packets. On a fairly busy network, this can mean two minutes or less of network traffic. Adding more memory to the LANalyzer for Windows workstation will help, as well as making sure that you don't have any extra applications running when you are capturing packets.

## LANalyzer Q & A: Capturing Undersized Packets

**While running LANalyzer for Windows, I noticed that it reported two undersized packets in the alarm section. Is there any way I can run a capture to record these events and identify the source of the problem?**

Create a capture filter in LANalyzer for Windows by using the Capture->Filter menu. Restrict the packet capture to Errors only. Make sure you check the box at the bottom of the dialog box that says Apply to Station Monitor. This will help identify the station reporting the problem.

## LANalyzer Q & A: Server Overload Messages

**In LANalyzer for Windows, I periodically receive NetWare server overload messages. When this happens, I don't notice any abnormal activity on the server. None of the users seem to have a problem in response time. How do I fix this?**

The NetWare server overload messages are messages you should not ignore. LANalyzer for Windows is generating alerts based on seeing a "server busy" packet (NetWare Core Protocol [NCP] code 9999). You might not see any performance issues on the server when it generates this packet. It is a good idea to make sure that you have the latest LAN drivers for the network adapters in the server.

## LANalyzer Q & A: User Names Don't Appear on NetWare 4.x Network

When I run LANalyzer for Windows v2.1 on a NetWare 4.x network, I have a problem with a few workstations that show the Media Access Control (MAC) address of the workstation but not the user name. I didn't have this problem when I was using NetWare v3.x. Do I need to change the configuration of LANalyzer for Windows?

This is a known problem with v2.1 of LANalyzer for NetWare in NetWare 4.x NetWare Directory Services when names exceed 20 characters. The problem has been identified by Novell development and should be fixed in the next release of LANalyzer for Windows. A temporary workaround is to run these workstations under NETX.

# LANalyzer Q & A: Watching Multiple Segments

**Is there any way I can get LANalyzer for Windows to watch traffic on segments other than the one I am on?**

You will need to upgrade from LANalyzer for Windows to ManageWise, which includes a multi-segment version of the LANalyzer NetWare Loadable Module (NLM). This will monitor all network adapters in the server running the Network Management Agent.

# LANalyzer Q & A: Macintoshes and General Protection Faults

**Since adding NetWare for Macintosh to our network, LANalyzer for Windows gets a General Protection Fault (GPF) in Windows shortly after starting up. This problem didn't happen before the Macintoshes appeared on the network. Do I need to change something in the configuration of LANalyzer for Windows to address the GPF?**

Make sure you have the latest LAN driver for the network adapter in your workstation, as well as the latest Open Data-link Interface (ODI) drivers. Make sure you are also using the latest Windows Dynamic Link Libraries (DLLs) for your workstation, which relate to those used by the NetWare client software. The first test to try is to not load APPLE.EXE. Ignore the warnings you get as you start up Windows and LANalyzer, which are caused by APPLE.EXE not being loaded. See if LANalyzer for Windows will run without AppleTalk support. Another thing to try is making a small change to the LZFW.INI file that resides in your Windows directory. Change the line that says ACTIVE TESTS=1 to read ACTIVE TESTS=0. This will stop LANalyzer for Windows from polling the network. Load APPLE.EXE and see if it runs any differently.

# LANalyzer Q & A: Monitoring ARCnet Networks

**How do I configure LANalyzer for Windows to watch ARCnet networks?**

You can't. LANalyzer for Windows only supports Ethernet or token-ring networks.

# LANalyzer Q & A: 3C509 Adapter and No Bad Packets

**I am using a 3Com 3C509 adapter with LANalyzer for Windows 2.1. I have yet to see any "bad" packets on the network. This is surprising, since I have over a hundred active users. Have I configured something wrong?**

No. The 3C5x9 series adapters filter out any packets that have an error in them before the Open Data-link Interface (ODI) drivers get the data. It passes other packets through. You might want to look at another brand of network adapter.

## LANalyzer Q & A: Windows 95 and Slow Operation

**I am trying to run LANalyzer for Windows under Windows 95. When I can get it to work, its operation is extremely slow, as are screen updates. I don't think it is a Windows 95 problem, because as soon as I exit LANalyzer for Windows, Windows 95 returns to its normal speed. Do you have any ideas about what is happening and how I can fix it?**

Novell doesn't support the use of LANalyzer on Windows 95 at this time. Until a version is released that will work or an update is released that allows the current version to cohabitate, treat Windows 95 like Windows v3.1 and go through the appropriate troubleshooting steps.

# LANalyzer Procedure List

[LANalyzer for Windows--Installation](#)

[Packet Capture in LANalyzer for Windows and Filtering (SAP Packets)](#)

## Procedure: LANalyzer for Windows--Installation

1. Check the system requirements for the program. (The program will not operate properly if the minimum system requirements are not met.)

2. On a workstation meeting the requirements, run Windows 3.1 on a NetWare v3.11 network in enhanced mode.

3. Put LANalyzer Disk 1 in the diskette drive.

4. Select File in Windows.

5. Select Run.

6. Type A:\SETUP and press the Enter key.

7. Press the Enter key again.

8. Select Install and press the Enter key.

9. Select the appropriate type of installation and press the Enter key.

10. Type the name of the company and the serial number and press the Enter key.

11. Enter the correct path for the files and press the Enter key. Press Enter only to accept the default drive designation.

NOTE: Novell recommends that you install LANalyzer for Windows to a local drive and run Windows from a local hard drive in the event the network experiences problems.

12. Insert Disk 2 when prompted.

13. Allow the Setup program to update the Windows' SYSTEM.INI file (this places VCAFT.386 and other statements in the 386 Enhance section).

14. Allow the Setup program to update the AUTOEXEC.BAT file.

15. Enter the path to the NET.CFG file. (This a the statement DI.COM on loading).

16. Select the network adapter driver you are using.

17. Press the Enter key.

18. Select Yes to select the NetWare Expert Tutorial.

NOTE: The NetWare Expert is a valuable instant reference feature to LANalyzer for Windows (It takes an additional 4 megabytes of hard drive space).

19. Insert the NetWare Expert Tutorial Disk 1.

20. When prompted, insert the NetWare Expert Tutorial Disk 2.

21. Exit Windows.

22. Make sure DI.COM is loaded in DOS.

23. Load Windows.

24. Double click on the LANalyzer icon.

## Procedure: Packet Capture in LANalyzer for Windows and Filtering (SAP Packets)

1. Start LANalyzer for Windows.

2. Select the Capture menu.

3. Select the Filter option.

4. Select the NetWare protocol.

5. Click on OK.

6. Click on the packet capture Start button.

7. When at least half of the circle is full, click on View.

8. Scroll down the top window and find the word "SAP" in the Layer column.

9. Click on SAP.

10. Click on Socket OX400F in the second window.

11. Click on OK.

12. Click on OK.

13. These are your SAP packets.

14. Clear the Filter by clicking on the Capture menu.

15. Click on the Filter option.

16. Click on Clear.

17. Click on OK.

## LANalyzer Required

**Console requirements:**

- 80386SX or better CPU

- 4MB RAM

- 5MB disk space

- Floppy drive

- Ethernet or token ring adapter with promiscuous mode driver

- Windows v3.1

# NetWare Navigator



**CD HELPdesk Series: Novell Products**

Click on any icon for more information

## NetWare Navigator Q & A

[NetWare Navigator Definition](#)

[NDS Compliance](#)

[NN.NLM Problem After Server ABEND](#)

# NetWare Navigator Q & A: NetWare Navigator Definition

**What is NetWare Navigator?**

Netware Navigator is an unattended electronic software distribution NetWare Loadable Module (NLM) from Novell. Electronic software distribution eliminates the need to visit every workstation when updating software. Instead, the software is prepared from a central location and then distributed either to the workstation directly, or to a set of distribution servers.

In small organizations, distributing the software to the workstation directly is the simplest and most efficient route. However, in larger organizations, distributing software in this manner might bog down the network, so certain servers on the network are targeted as distribution servers. The Netware Navigator primary server then delegates the distribution task to multiple secondary servers, which then distribute the software to the workstations.

Administrators can install and distribute software, data, applications, network operating systems, and workstation operating systems with Netware Navigator. Navigator supports DOS, OS/2, and Microsoft Windows.

Some of the features of NetWare Navigator are the following:

Scheduling--Network supervisors can schedule distribution during off-peak traffic periods. Tasks can be scheduled to be performed unattended daily, weekly, or monthly, depending on the nature of the task.

Automated Installation--The downloading of new applications and data is transparent to users. Supervisors can generate scripts to test for certain conditions on the workstation, back up workstation software, install new software, run macro files, edit the AUTOEXEC.BAT, CONFIG.SYS, INI, and other files, and write audit information to a log file. If this operation is performed when a user might be present, a warning screen pops up to let the user know. The user can accept the download or defer it to a more appropriate time.

Audit Log--Download audit logs with reporting features are provided. A log is a record of the event that tells what was successful, what was not, and why. Scripts can be written to back out of error situations.

Security--Distribution is permitted only by authorized individuals. Workstation keyboards are locked by Netware Navigator while downloads are performed,

since it is necessary to log that workstation onto the network.

Cost--NetWare Navigator can cost as little as $995 for a 25-user, $3,000 for a 100-user, or $30,000 for a 2,000-user license. Other prices are available, but this should give you a general idea.

## NetWare Navigator Q & A: NN.NLM Problem after Server ABEND

**Because of a disk crash in the server, we had to restore the volumes from tape. We found a problem in the NN queues and deleted them using NWADMIN. The queues were recreated in JCONSOLE. When NN.NLM attempts to load, we receive the following error message on the server console: "DJOBSCHD: AttachQueueServerToQueue failed." How can we fix the problem?**

Even though you recreated a queue with the same name, the queue ID has changed. This is why the NetWare Loadable Module (NLM) won't load. Now that the queue ID has changed, your only option is to reinstall NetWare Navigator. If you suffer another disk crash in the future, read TID 400014 in the TID forum on CompuServe for information on backing up the CONFIG files and uninstalling NetWare Navigator.

## NetWare Navigator Q & A: NDS Compliance



**I am getting ready to upgrade to NetWare 4.10. When will NetWare Navigator be NetWare Directory Services (NDS)-compliant?**



Novell is working on a NDS-compliant release of NetWare Navigator but has not announced when it will be released.

# NetWare Navigator Procedure List

[Installing NetWare Navigator](#)

[Installing Staging Server](#)

## NetWare Navigator Procedure: Installing NetWare Navigator

1. Log in to the server as Supervisor or equivalent.

2. Start Windows.

3. Select Alt-F, Run.

4. Enter A:SETUP and press the Enter key.

5. Select Install Login Distribution Server and press the Enter key.

6. Enter the name of server you are installing this product on and press Tab.

7. Enter the login name you are logged in now as and press Tab.

8. Enter the login ID's password and press the Enter key.

9. Click on OK and press the Enter key.

10. Enter the console user name (e.g., NETNAV) and press Tab.

11. Enter the password for the console user and press the Enter key.

12. When the install completes, you will be notified of any problems.

## NetWare Navigator Q & A: Installing Staging Server

1. From NetWare Navigator install and configure screen, select install staging server/clients and press the Enter key.

2. Click on server you are installing this to and press the Enter key.

3. Click on add.

4. Click on OK.

5. Enter the NETNAV console id and press tab.

6. Enter NETNAV's password and press the Enter key.

7. Click on OK.

8. Click on OK to response to successful install message.

## NetWare Navigator Required

**Server requirements:**

- NetWare 3.x or 4.x

- Distribution server: 14MB of disk space

- Staging server: 5MB of disk space

**Client requirements:**

- Microsoft Windows 3.1 for console

- Other clients can use DOS, Microsoft Windows, or OS/2

## NetWare Navigator Utilities

[BrightWorks from McAfee](#)

[SiteExpress from McAfee](#)

[SoftWare Sentry from Microsystems Software](#)

## NetWare Navigator Utility: BrightWorks from McAfee

BrightWorks 2.0, an integrated enterprise network management suite for NetWare 3.x and 4.x networks, includes server monitoring, server performance tuning, help desk, and advanced scripting modules, as well as enterprise metering, inventory, and software distribution capabilities.

To install this software, copy the directory D:\PROGRAMS\MCAFEE\BWORKS to your hard disk. Then run the SETUP program from the Windows Program Manager File Run command line. If your hard drive is designated as drive C, type C:\MCAFEE\BWORKS\SETUP.EXE and choose OK.

## NetWare Navigator Utility: SiteExpress from McAfee

SiteExpress is an Electronic Software Distribution package that contains enterprise software distribution capabilities, as well as management reports.

To install this software, copy the directory D:\PROGRAMS\MCAFEE\SITEXP to your hard disk. Then run the SETUP program from the Windows Program Manager File Run command line. If your hard drive is designated as drive C, type C:\SITEXP\SETUP.EXE and choose OK.

## NetWare Navigator Utility: SoftWare Sentry from Microsystems Software

 Software Sentry from Microsystems Software Inc. is a license metering and software asset management package for any network, including NetWare.

To install Software Sentry, copy the subdirectory \PROGRAMS\MICROSYS to your hard disk. From the File Run command, type SETUP.

## Enterprise MPR

**CD HELPdesk Series: Novell Products**

Click on any icon for more information

Q+A

PROCEDURE LIST

REQUIRED

VENDOR LIST

## Enterprise MPR Q & A

[Dedicated or Server-based Installation at Remote Locations](#)

[Error Message After Entering a Route](#)

[Linking Two Networks in Same Calling Area Without a Leased Line](#)

[Losing Default Gateway Setting](#)

[Microsoft's DHCP TCP/IP Integration](#)

[Variable Length Subnet Masks](#)

## Enterprise MPR Q & A: Error Message after Entering a Route

**I am trying to enter a route into the table of a remote MultiProtocol Router using TCPCON. I receive the error message "No host response" when I try to enter the network and gateway IP address. What am I doing wrong?**

When you make a remote entry using TCPCON, the Control Community option must be enabled when the Simple Network Management Protocol (SNMP) is loaded on the target server. Control Community is disabled by default. Also verify that you are loading SNMP with a command parameter such as LOAD SNMP CONTROL=PUBLIC. You can use a Control Community name other than PUBLIC if you want.

## Enterprise MPR Q & A: Losing Default Gateway Setting

**We are having a problem with the MultiProtocol Router (MPR) losing the default gateway setting about 4-5 minutes after MPR has loaded. We have enabled a device on the network to broadcast as the default gateway but it doesn't seem to work. Do you have any ideas about what is wrong and how to fix it?**

It sounds like TCPCON's routes are getting "aged out." Try changing them to a static route and see if this helps. Using IPCONFIG is also an option. It wouldn't hurt to make sure that the MPR installation also has the latest LAN drivers for all network adapters in the server--this could be a communications-related problem caused by an older driver. You might also have a flaky or intermittent LAN adapter that is "deaf" to information broadcast on the network.

## Enterprise MPR Q & A: Variable Length Subnet Masks

**I am trying to implement a variable-length subnet mask to accommodate both current and future LANs. We have been forced into this due to a limited number of Class C addresses. When I try to enter the subnet mask into TCPCON or IPCONFIG, I receive an error message that says the route is invalid. According to the Request for Comments (RFCs) I have found, this is a valid operation. The Novell documentation doesn't say it can't be done. What am I doing wrong?**

You aren't doing anything wrong. Variable-length subnet masks weren't supported until version 3 of the MultiProtocol Router (MPR). Support for this type of subnet mask requires Routing Information Protocol (RIP) II and Open Shortest Path First (OSPF) support, which isn't included in earlier releases of the MPR.

## Enterprise MPR Q & A: Microsoft's DHCP TCP/IP Integration



**One of our remote offices has implemented Microsoft's DHCP TCP/IP solution. How we integrate this with the MultiProtocol Router (MPR)?**



The two should work together. Load BOOTPFWD.NLM on the NetWare server. If you are using MPR 3.0, there is a setting in INETCFG.NLM that will also help you.

## Enterprise MPR Q & A: Linking Two Networks in Same Calling Area Without a Leased Line

**We have two networks in the same local calling area that we would like to connect together. Is it possible to link them without using a leased line?**

The MultiProtocol Router (MPR) 3.0 has an asynchronous dial-on-demand option that will help you do this. You will also need a Digiboard or multiport serial adapter for a high-speed connection for the modems. If you are only linking the two LANs together and won't be using Global MHS or NetWare Connect, Hayes has a single-port ESP serial adapter that works nicely and is very reasonably priced.

## Enterprise MPR Q & A: Dedicated or Server-Based Installation at Remote Locations

**I am getting ready to install the MultiProtocol Router (MPR) at a remote location. Should I install it on a dedicated box or can it run in the existing NetWare v3.12 server?**

Your decision should be governed by the amount of traffic this copy of MPR will be handling and the number of NetWare Loadable Modules (NLMs) already running on the server. If the traffic is low or the number of NLMs isn't too great, you can save hardware and money by installing MPR on the existing server.

## Enterprise MPR Procedure List

[Configuring Automatic Async Connection to a Remote Network](#)

[Establishing a Dial on Demand Connection](#)

## Enterprise MPR Procedure: Establishing a dial on demand connection

1. Install MPR 3.0 software.

2. Install multiport serial card (i.e. Digiboard).

3. Load drivers for multiport serial card.

4. When loading drivers in Step 4, specify the name= on load line (use something like name=digi2p).

5. Load inetcfg (answer yes if prompted to import settings from autoexec.ncf).

6. Highlight boards and press the Enter key.

7. Press the Insert key.

8. Select WHSMAIO and press the Enter key.

9. Enter board name specified in Step 4 and press the Enter key.

10. Press the Enter key on board name specified in Step 9.

11. Select port to be used and press the Enter key (if the port on the board you are using is labeled port 0, then select port one in inetcfg).

12. Press Esc to return to internetworking configuration menu.

13. Select network interfaces and press the Enter key.

14. Select board name specified in Step 4 and press the Enter key (should be labeled unconfigured).

15. Select PPP from available media list and press the Enter key.

16. Press the Enter key on interface speed line.

17. Select correct speed rate and press the Enter key (be aware, there is a possible problem with WHSMAIO and 14.4 speed, in that case, select 19.2).

18. Press the Enter key on modem/DCE type.

19. Select correct modem type and press the Enter key (if modem is not listed,

select Hayes-compatible).

20. Press Esc and select yes to save changes.

21. Press Esc to return to internetworking configuration menu.

22. Select WAN call directory option and press the Enter key.

23. Press the Insert key.

24. Enter WAN call destination name (can be the name of the server being called) and press the Enter key.

25. Select PPP and press the Enter key.

26. Change call type to on demand and press the Enter key.

27. Select interface name and press the Enter key.

28. Select board name as specified in Step 4 and press the Enter key.

29. Press the Enter key on telephone number, enter telephone number and press the Enter key.

30. Press the Enter key on password field.

31. Enter password (same on both side of connection, case sensitive) and press the Enter key.

32. Press the Enter key on remote system id, select name as specified in Step 24 and press the Enter key.

33. Press Esc, select Yes and press the Enter key.

34. Answer yes to synchronize authentication database and press the Enter key if prompted.

35. Press Esc to return to internetworking configuration.

36. Select bindings and press the Enter key.

37. Press the Insert key.

38. Select IPX and press the Enter key.

39. Select board name as specified in Step 4 and press the Enter key.

40. Press Esc.

41. Select Yes and press the Enter key.

42. Press Esc.

43. Select Yes and press the Enter key.

44. At file server console prompt, type reinitialize system and press the Enter key.

45. At the file server console prompt, type load callmgr and press the Enter key.

46. To establish connection, press Insert and select the board name entered in Step 24 and press the Enter key.

47. Select IPX and press the Enter key.

48. Connection should be established shortly.

## Enterprise MPR Procedure: Configuring Automatic Async Connection to a Remote Network

1. Complete procedure for establishing a dial on demand connection.

2. At file server colon prompt, type load inetcfg and press the Enter key.

3. Select protocols and press the Enter key.

4. Select IPX and press the Enter key.

5. Select static services for on demand calls and press the Enter key.

6. Press the Insert key.

7. Press the Enter key on WAN call destination.

8. Select WAN call destination as specified in Step 24 of establishing a dial on demand connection.

9. Press the Enter key on service name.

10. Enter name of remote file server being connected to and press the Enter key.

11. Select service address network and press the Enter key.

12. Enter internal ipx network number of remote file server and press the Enter key.

13. Press Esc.

14. Press Esc.

15. Press Esc, select yes to save changes and press the Enter key.

16. Press Esc.

17. Press Esc, select yes to save changes and press the Enter key.

18. At the file server colon prompt, type reinitialize system and press the Enter key.

19. At the file server colon prompt, type display servers and remote file server name should now appear.

20. Specifying the remote server name via attach, login or map, etc will initiate a dialup connection to the server.

## Enterprise MPR Required

- 12MB of RAM

- 80MB of disk space

- LAN adapter with ODI-compliant driver

- WAN adapter that is ODI or AIO-compliant

**Online Services**



**CD HELPdesk Series: Novell Products**

Click on any icon for more information

## Online Services Q & A


### *COMPUSERVE*
Downloading Files from CompuServe

E-Mail on CompuServe

Finding Information Fast on CompuServe

Format of CompuServe Questions

GO Words for Computer Companies and Services on CompuServe

Information about the CompuServe Information Manager

NetWire and Its Forums

Networking Companies on CompuServe by Category

Networking Companies on CompuServe in PC Vendor Forums

Networking Magazines and Services on CompuServe

Subscribing to CompuServe

TAPCIS Information


### *The INTERNET*
Finding Information on the Internet

Internet Definition

Internet Dial-Up Options

Internet E-Mail

Internet Firewalls

Internet for Non-UNIX Users

Internet Search Engines

Internet Services

[Internet vs. CompuServe](#)

[Networking Information on the Internet](#)

[Novell's Presence on the Internet](#)

[Usenet](#)

[World Wide Web](#)

# Online Q & A: Internet vs. CompuServe

**Why would I use the Internet instead of CompuServe?**

It's said that the best things in life are free, but this is another case where free is a matter of term and degree. Each Internet Access Service comes with a monthly service fee of some kind. Beyond an initial monthly allotment of online time, additional hours cost additional money.

Because the brief answer to this question is "Because it's cheaper," we have to explain a little more about the pricing structure of CompuServe and the Internet, so that you can understand what we mean. CompuServe also imposes a monthly fee ($9.95), and also charges for hours beyond a monthly allotment (around $4.80 per hour for each hour over the monthly five-hour allotment, unless you're calling from outside the United States). Most Internet Service Providers (ISPs) charge somewhere between $0.20 and $1.00 for each extra hour, which is already quite a bit cheaper.

Finally, there's a speed difference between the two worlds. CompuServe has only announced forthcoming support for Integrated Services Digital Network (ISDN), you can use either or both of these technologies to connect to the Internet via most ISPs today (at least, in areas where ISDN service is available at all). It's always true that a faster link will cost more money, but it's equally true that the average access charges seem to be lower from ISPs than from CompuServe.

So figure it out: With the Internet, you can get an account cheaper, pay less for extra hours, avoid forum charges for the information that interests you most, and obtain faster links more cheaply.

## Online Q & A: Networking Information on the Internet

**What kinds of useful information about networking can I find on the Internet?**

Nearly everything you'll ever want to know about networking is on the Internet. Unfortunately, it's indiscriminately mixed in with a bunch of stuff you don't want to know about networking, or at least, don't want to mess with right now. When searching for the nuggets of gold amongst the rocks and weeds, here are some of the more profitable kinds of things to look for on the Internet:

Information on networking standards
You'll find lots of useful stuff from ANSI, the IEEE, the IAB/IETF, the TIA/EIA, and more on the Internet. Use your favorite World Wide Web (WWW) search engine with the name of the standards body that controls the standard you're interested in, and take it from there.

Information on networking companies
Because networking and the Internet go together so nicely, many networking companies have a presence on the Internet. You can use their Internet sites to get product information, news bulletins, and release data, to contact technical support, and to search their file libraries. Use your favorite WWW search engine (or call or e-mail the company) to get its Web site's Uniform Resource Locator (URL).

Information on networking technologies
Use your favorite WWW search engine with a technology name or acronym, and watch the hits mount up. This can be handy when researching existing or older technologies, but it can be a real lifesaver when you're looking for information about state-of-the-art or bleeding-edge technologies.

Other things to try
Don't forget to check the mailing lists and the relevant newsgroups when you're mining for information. These groups are usually visited by the occasional guru, if not populated by them. These people know where the really good stuff is; if you can identify them, don't be afraid to ask them directly by e-mail. If not, ask the whole group and see what turns up.

All we have to add at this point is: happy hunting!

## Online Q & A: NetWire and Its Forums

**Could you explain NetWire and its forums?**

NetWire is an electronic service maintained by Novell and located on an online bulletin board service called CompuServe. You can picture and think of NetWire as a virtual public building with virtual floors and virtual rooms. Inside the building, you can do the following:

• find technical help
• give technical help
• find patches, drivers, and utilities to download to your PC

The floors in the NetWire building are organized so that you will find help for specific areas of Novell by choosing a specific floor. For example, if you want to find information about NetWare 4.x, you will travel to the floor marked NETW4X (called the NETW4X forum). Once you reach that floor, you will find several different rooms to choose from that relate to NetWare 4.x products. The rooms are organized by the function they represent. So, for example, one will find the following rooms on the NETW4X floor:

1. Printing
2. NetWare Utilities
3. Dsk Drvs/CDs/Cntrls
4. LAN Cards/Drivers
5. Install/Upgrade
6. ElectroText Docs
7. Directory Services
8. Closed See Sect 7
9. SFT III
10. NLM/OS/Console Util

Once you choose and enter one of these rooms (called a section), you'll find an electronic bulletin board (much like a regular bulletin board), a room monitor (called a Sysop), and a list of topics of questions being discussed.

Let's say you've entered the Printing room. You can now post a note on the bulletin board and read and respond to other notes on the bulletin board. If you post a note on the bulletin board, it may be answered by one of your peers or by the Sysop.

Sysops are voluntary network professionals that Novell contracts with to read and answer questions on NetWire. They are chosen by the other NetWire Sysops for their expertise in the networking field.

Although we used an example of a building separated by floors and rooms, your interaction with NetWire is electronic. Once you've gained access to CompuServe, typing GO NETWIRE presents you with a list of forums to choose from. Optionally, you can go directly to a specific forum if you know the forum name. For example, GO NETW4X takes you directly to that forum and presents you with a list of sections to choose from.

Summary
NetWire is a collection of electronic forums maintained by Novell and organized by product category. Within each forum, there are sections categorized by function. Anyone with access to CompuServe can access NetWire and read and post notes or download files. All notes posted on CompuServe are public and can be seen by anyone in the world.

A List of Forums on NetWire
We'll explain some of the forums to give you examples.

Netwire Main Menu     NOVELL
1. What's New
2. Sales and Marketing
3. Technical Services
4. Novell Programs
5. File Updates
6. New User Information

NetWare Systems Support     NOV-574
1. Search Databases
2. Post A Question
3. Download Files, Patches, and Drivers
4. Novell Labs
5. Top Issues
6. Application Notes (private service)

Technical Services     NOVSS
1. About On-Line Technical Services
2. NetWorking NetWare Products
3. UnixWare Systems Support
4. PerfectOffice, WordPerfect, Quattro Pro, PerfectHome
5. GroupWise, InForms, SoftSolutions
6. Developers
7. International Support Areas
8. CompuServe Support Directory

## 9. User Contributed Information

# Online Q & A: Internet Firewalls

**I recently signed up our company for an Internet account. We have a NetWare v3.12 network that my users will use for Internet e-mail only. What is, and do we need, a firewall?**

A firewall is software or hardware coupled with security policies that help prevent unauthorized access to a network. If you are contemplating connecting your network to the Internet, you should implement a firewall for security reasons. The type of firewall you implement will depend on the level of security you need, and how much is budgeted for the project. For example, you could implement a firewall by Digital Equipment Corp. that costs $40,000, or you could download some shareware software that is free.

At the end of this discussion, we'll list several good references for information on Internet security issues.

Even though you mention that you will only hook up your network to the Internet to exchange e-mail, you should be aware that information sent to the Internet can be hacked and reused later to infiltrate your network. Items like passwords and credit card information are hot items to hack. Your network should be considered one of your company's assets and treated as such. Connecting to the Internet without any type of protection against hackers could open up your network to all kinds of intrusions.

The term firewall is used to conjure up an image of a wall that prevents the danger of fire from spreading. In reality, a firewall can be a UNIX machine combined with special software that acts as a gateway between your network and the Internet. This gateway can filter out information coming into your network. It can also monitor activity passing through it and log suspicious activity, as well as provide alerts to a management console. The trick here is that someone needs to monitor the logs and alerts. Messages can be filtered based on message header and message contents.

A firewall gateway can also be a special router designed to provide basic security between your network and the Internet connection. These routers provide limited security at a lower cost than other solutions.

These firewall gateways are unable to detect viruses. Therefore, it is critical that your network provide its own virus-checking, as well as the workstations connected to the network. It is too easy for a user to obtain an infection file from

the Internet.

The following list refers you to magazine articles and books in which you can find research material on this topic. All these articles point you to information that can be downloaded for free from the Internet, mailing lists you can join, etc. You should carefully study your firewall options before selecting a particular route.

Cheswick, William R. and Steven M. Bellovin. *Firewalls and Internet Security*. Addison-Wesley, $26.95. Written by researchers at AT&T's Bell Labs that tracked an actual hacker and used the information to design AT&T's firewall.

Phillips, Ken. Securing the enterprise; without adequate safeguards, corporate data lies exposed to outside and inside threats. *PC Week*, April 10, 1995, v12 n14, pN1.

Stark, Thom. The Internet: Is it safe? *LAN Times*, March 27, 1995, v12 n6, p126.

Baum, David. Building bridges, building walls: The demand for security fire walls is expanding. *InfoWorld*, Jan 16, 1995, v17 n3, p62.

Schurr, Amy. Build it, and they won't come. *PC Week*, Dec 12, 1994, v11 n49, pN22.

Moody, Glyn. How to protect and survive in an insecure world. *Computer Weekly*, Dec 1, 1994, p48.

Harwood, Ray. Install the wall. *DEC Professional*, Dec 1994, v13 n12, p44.

## Online Q & A: Internet Definition

**What is the Internet?**

The Internet is an interconnection of computer networks throughout the world. Many of the networks that can be found connected to the Internet are large organization, government, and university networks. Since not all companies or users have the money or the resources of universities and the government, other companies have sprouted up called Internet Service Providers (ISPs). These organizations permit a user or company to dial into an Internet provider's location and access the Internet through their host resources (whether they are UNIX boxes using 56Kbps, T1, or Integrated Services Digital Network (ISDN) communications links). So, a single user can connect to an Internet provider through his or her modem for $5 to $30 per month (depending on the rates and needs). The user would then connect to the Internet provider's host using a terminal emulation package and communications link to the Internet.

Another way is to connect directly to the Internet with your computer instead of going through a commercial provider. This requires that you have a PC, modem, and telephone line, and that your PC become a host. Your PC will need to run the TCP/IP protocol suite, since that's the most widely used protocol on the Internet.

The Internet is hard to define in specific terms because it keeps changing and expanding. Trying to describe the Internet is similar to trying to hit a moving target. In a sense, the Internet is anything you want it to be. It is a vast collection of networked computers that contain all kinds of information. For example, if your interest is in NetWare, you can go out on the Internet and find information about NetWare such as technical ideas, white papers, and problems encountered, and also find other NetWare gurus. If your interest is in gardening, you can find information about that topic also.

Users must log into the Internet with their own login ID and sometimes a password associated with their accounts. The unique password permits users to send and receive mail from that ID. Many times you will see something similar to "jim@LANguru.com" on business cards. This is their Internet address, which you can send e-mail to (like your street address, city, state, and zip code on a piece of mail).

# Online Q & A: Internet Services

**What services are available on the Internet?**

The following are a few of the basic services available on the Internet, once you're connected:

Telnet
This command is found in the TCP/IP suite of protocols and is used for logging onto a remote host on the Internet. Performing a Telnet to a host simply connects you to that host. Once connected, you'll still have to enter a logon ID and password.

File Transfer Protocol (FTP)
FTP is the protocol used to transfer files between hosts. If your PC is connected to the Internet directly and acts as a host, you will only have to initiate an FTP session from the host on the Internet to your PC. If you're connected through an Internet service provider, (ISP) you'll have to initiate an FTP session from the Internet host to the ISP's host, and then transfer the file from that host to your PC. An example of when you might use FTP is to transfer a NetWare patch to your PC from a host on the Internet.

e-mail--Simple Mail Transfer Protocol (SMTP)
E-mail is the service that permits users to send mail to one another. The protocols used in e-mail on the Internet is SMTP. There are many utilities that permit a user to create and send mail using a user-friendly interface. The utilities rely on SMTP to transport the message. Novell has introduced its DOS-based SMTP mail gateway and NetWare Loadable Module (NLM), which can be connected between an organization and the Internet. Users in the organization can send and receive mail to the Internet through the gateway. The gateway converts the e-mail protocol to the SMTP protocol and vice versa.

Some of the online services such as CompuServe and America Online provide e-mail gateways to the Internet so their users can send and receive e-mail. Many NetWare network administrators today already have a Compuserve account because of Novell's NetWire presence. If you do, here's how you can send mail to the Internet:

    NAME:                ADDRESS:
    Recipient's Name     INTERNET:jim@LANguru.com

The important portion of this is the ADDRESS field. It is also important to note that there are no spaces in the address. Additionally, you'll need to set your defaults to accept postage due messages because there is a charge.

In addition, if someone on the Internet wants to send e-mail to you at your CompuServe e-mail address, here's how he or she should address the e-mail:

   55555.555@compuserve.com

in which the numeric characters indicate the user's unique CompuServe address and the remainder of the address is the address of the CompuServe gateway.

## Online Q & A: Finding Information on the Internet

**How do I find information on the Internet?**

The Internet differs from services like America Online and CompuServe in that the Internet has hosts all over the world that are linked together. CompuServe's hosts are centralized in Columbus, Ohio, with access points throughout the world. On CompuServe, you can get a list of all of the forums and each forum's access term (i.e., GO NETWIRE). You can also search for a CompuServe user by name, city, state, and country. Navigating the web-like Internet is a lot different than these other online services because the architecture of the Internet is different.

Companies or users provide services with user-friendly interfaces that help users navigate their way through the Internet to locate information. Below is a list of some of the more common services:

Gopher--Developed by the University of Michigan, it is a menu-based search and retrieval service for documents

World Wide Web (WWW)--Searches through the contents of files and uses hypertext links to connect documents

Archie--Used for locating information on anonymous FTP hosts. Archie is limited in the sense that it doesn't search through the contents of files, only the directory listings.

## Online Q & A: Internet Dial-Up Options

**What kinds of dial-up options are available for connecting to the Internet?**

Good question!   There are three primary kinds of dial-up connections available for Internet access. They vary in capability, complexity, and cost.

The cheapest option is a simple dial-up connection to an Internet Service Provider (ISP); if you elect to use this approach, you'll only need a modem, a telecommunications program, and a simple dial-in account. In most places, this kind of access can be had for under $20 a month for 10-20 hours of online time. The primary disadvantage to this approach is that it requires you to log into and interact with the Internet using terminal emulation on your ISP's host machine. In English, this means you'll have to learn UNIX commands and utilities to use the Internet.

The other two options use two different TCP/IP-based networking protocols to let your PC act like it's attached directly to the Internet (albeit over a telephone-based connection). The first variant uses a protocol called the Serial Line Interface Protocol, most commonly know by its acronym, SLIP. SLIP is an older protocol that nevertheless permits you to run fancy graphical user interface (GUI) software right on your PC and to download files or other information directly from its Internet source to your own machine (Dial-up users have to perform a two-step maneuver: First, copy information to the ISP's machine, and then use a file-transfer program to copy it from there to their PC.)

The second of these "direct attachment" approaches is called PPP, which stands for Point-to-Point Protocol; it's a more modern connection technology, and is therefore faster and a bit easier to use. For the same reason, it usually costs a little more; whereas most SLIP accounts start at around $25 or $30 per month, most PPP accounts start at $30 or more. Both have the same limitations: Because they permit you to act as a node on the Internet, you have to configure your machine with the proper logins and IP addresses, making setup and configuration a bit more difficult, and you have to spend additional money on obtaining the software that lets you exploit this technology to its maximum potential. While numerous shareware implementations of such software are available, we recommend that you consider buying a product such as NetManage's Chameleon NFS or Spry's Internet-in-a-Box, because they include all the elements you'll need to establish a working Internet connection, and they've been designed specifically to work together in harmony.

## Online Q & A: Internet E-Mail

**What is Internet e-mail?**

E-mail is probably the most widely-used and distributed source of information on the Internet today. It's not just a way to exchange messages with your friends and colleagues on the Internet; e-mail is also a powerful information pipeline for Internet information of all kinds.

When it comes to reading and sending e-mail, you'll have two different kinds of options at your disposal. If you're a terminal emulation user (probably on a UNIX host), you'll be using a UNIX mail reader of some kind, probably a program named something like mail, pine, or elm. If you're attached via SLIP or PPP, you'll probably use a GUI-based mail reader like Eudora, or a reader that comes bundled with one of the ready-to-run Internet access packages like Email for Chameleon NFS. Either way, you'd be well-advised to learn to use this program, because it will probably become your most-worn Internet tool over the years.

E-mail acts as an electronic gathering post for interest groups of all kinds, in addition to providing a terrific means of individual communication. In fact, there are lots of mail servers on the Internet whose job it is to collect messages from user communities and distribute them to anyone who's signed up for what's called a mailing list in Internet-speak. There are numerous lists for NetWare-related topics.

If you join such a mailing list, be warned that you'll have to dig through numerous messages on your topic of choice every day. But because there's usually lots of valuable information amidst the message traffic, most people find the effort is worthwhile.

# Online Q & A: Networking Companies on CompuServe by Category



**Numerous networking companies have forums on CompuServe you can access from CompuServe's top-level menu. Following is a list of some of these companies:**



**Following is a list of some of these companies:**

**Software Forums**
Anti-Virus Vendor Forum
Ask3Com
Attachmate Corporation
Attachmate Crosstalk Forum
Attachmate Forum
Btrieve Technologies Forum
Cheyenne Software
Citrix Forum +
Computer Associates
Da Vinci Forum
Data Based Advisor
DataEase International Forum
DBMS Forum
Delrina Forum
Digital Equipment Corporation
Digitalk
Frame Relay Forum
Gupta Forum
Hayes
IBM Corporation
Informix Forum
Intel Corporation
Internet New User Forum
Internet Publishing Forum
Internet Resources Forum
ISDN Forum
LAN A Vendor Forum
LAN B Vendor Forum
LAN Magazine Forum
LAN Technology Forum
Lotus Development Corporation
McAfee Virus Help Forum

Microsoft Connection
Microtest Inc. Forum
NCSA Security Vendor Forum
NetWare Solutions Forum
Norton/Symantec Forums
Novell Desktop Systems Group Forum
Novell NetWire
NPA Member Forum
NT Workstation Forum
OpenDoc Forum
Oracle User Group Forum
Quarterdeck Forum
Sybase Forum
Symantec Forums
TAPCIS Forum
Thomas-Conrad Forum
UnixWare Forum
Visio Forum
Windows Utility Vendor A Forum
WinSupport
Wireless Comms. Forum
WordPerfect
World of Lotus
WRQ/Reflection Forum
WUGNET Forum
Ziff PCpro Forum
ZiffNet

**Hardware Forums**
Adaptec Forum
APPC Information Exchange Forum
Ask3Com
AST Forum
Attachmate Forum
Bay Networks Forum
Benchmark & Standards Forum
Cabletron Systems, Inc.
Compaq Connection
CompuAdd Forum
Dell Forum
Digital Equipment Corporation
Eicon Forum
Gateway 2000 Forum
Hayes
Hewlett-Packard Forums
IBM Corporation

Intel Corporation
Internet New User Forum
Internet Publishing Forum
Internet Resources Forum
ISDN Forum
LAN A Vendor Forum
LAN B Vendor Forum
Lexmark Forum
Modem Vendor Forum
NCSA Security Vendor Forum
NCSA Vendor Forum
NPA Member Forum
NT Workstation Forum
Packard Bell Forum
PC Plug and Play Forum
Practical Peripherals Forum
Seagate Forum
Standard Microsystems Forum
Texas Instruments Forum
Thomas-Conrad Forum
Wireless Comms. Forum
Xircom Forum
Zenith Data Systems Forum

**Connectivity Services**
Ask3Com
Banyan Forums
Cabletron Systems, Inc.
Eicon Forum
Hayes Online Forum
LAN Magazine Forum
LAN Technology Forum
NetWare Solutions Forum
Novell NetWire (W)
Standard Microsystems Forum
SynOptics Forum
Thomas-Conrad Forum

**Modem Communications Forums**
Crosstalk Forum
Hayes Forum
Practical Peripherals Forum
TAPCIS Forum
Modem Vendor Forum

**Other/Related Platform Connectivity**

IBM Forums
Intel Forum
Microsoft Forums

**Research/Reference PCS-50**
CompuServe Software Information
Computer Consultants Forum
Computer Library
Computer Training Forum
Consumer Reports
Dataquest Online
Information USA
IQuest Technology InfoCenter
Macmillan Computer Publishing Forum
National Computer Security Association
SYBEX Publishing Forum

**Magazines/Electronic Newstand Magazines**
Data Based Advisor
DBMS Forum
LAN Magazine Forum
NetWare Solutions (GO NWSOLUTIONS or GO NWSFORUM)
STACKS: The Network Journal Magazine Forum
VARBusiness Interactive Exchange Forum
ZiffNet and Other Ziff Services

## Online Q & A: Networking Companies on CompuServe in PC Vendor Forums

**Networking Companies on CompuServe in PCVENA through PCVENK**

Numerous networking companies have forums on CompuServe. You will find many of them in the PC Vendor Support Forums (GO PCVENA through GO PCVENK) or on Novell's NetWire (GO NVENA or NVENB). Following is a list of these companies:

**PC Vendor A Support Forum**
Enable Software, Inc.
Saber
Magee Enterprises

**PC Vendor Support Forum B**
NetFRAME Systems
Reply Corporation
Network General
Beyond, Inc.

**PC Vendor D Support Forum**
Legato Systems
Micropolis
GammaLink
Procom Technology
Micro System Design
Pacific Data Products
Farallon Computing
ZEOS International

**PC Vendor E Support Forum**
American Power Conversion
American Cybernetics, Inc.
DSI Software Systems

**PC Vendor F Support Forum**
Acer America
Storage Dimensions
PUREDATA

PUREDATA Fax/Modem
Funk Software
Command Software Systems
Colorado Memory Systems
PCMCIA

**PC Vendor G Support Forum**
Faxworks/Global Village
Reach Software
Magic Software
Futurus Corporation
Cogent Data Technologies
Madge Networks, Ltd.
Advanced Logic Research

**PC Vendor H Support Forum**
ReferencePoint
Platinum Technology
Performance Technology
Alcom
Datapoint

**PC Vendor I Support Forum**
Sytron Corp.
Arcada Software
Kingston Technology
Norton-Lambert
Sterling Software

**PC Vendor J Support Forum**
FTP Software, Inc.
Galacticomm

**Novell Vendor A Forum (GO NVENA)**
Folio Corporation
BindView
Computer Tyme
Infinite Tech.
Dell Computer Corp.
AST Research
Best Power
ON Technology Corp.
RoseWare

**Novell Vendor B Forum (GO NVENB)**
Ontrack Data

NetWorth
Firefox
InterConnections
Simware
Ethosoft
Tobit Software
Denmac Systems
Mountain
Preferred Systems
Lantec
HiTecSoft
Vinca
Avanti Technology
Extensions Software
Palindrome
Microdyne

## Online Q & A: Information about the CompuServe Information Manager

**What is the CompuServe Information Manager (CIM)?**

CIM is a software program built for graphical CompuServe navigation that comes in two flavors:WinCIM, which works with Microsoft Windows, and MACCIM, which works with the Apple Macintosh. Both programs behave similarly, though, so we're comfortable discussing them together.

CIM programs are oriented around a graphical desktop that provides various icons and tools for typical CompuServe activities. There are separate menus and tools for most major activities, including conference rooms, e-mail, and the various forums that give CompuServe much of its value. CIM programs even include an Auto-Pilot feature that can help automate frequent or regular online activities.

The best tools CIM programs offer also include the Favorite Places icon, which lets you build a readily accessible list of regularly visited forums; the FIND command, which produces a clickable list of forums and other locations that match keywords you input; and e-mail, which not only makes it easy to send and receive messages, but also makes it a snap to send and receive files via e-mail.

All in all, the CIM programs provide excellent browsing capabilities for CompuServe. Whether looking for a specific file or searching for information on a topic, reading or writing e-mail, both WinCIM and MACCIM do an admirable job. If, however, you're doing any kind of activity in bulk (i.e., you want to read all of the messages for a particular forum), you'll find that other tools that support batch interaction with CompuServe are better suited for such tasks.

There is a copy of WinCim v1.4 on this CD located in the Online Utilities section.

# Online Q & A: TAPCIS Information

**What is TAPCIS?**

TAPCIS stands for The Automated Program for the CompuServe Information Service, and is a popular program for off-line access to CompuServe. TAPCIS is an important tool for CompuServe users who perform lots of file uploads or downloads, or who handle large volumes of forum traffic.

TAPCIS is a character-oriented DOS application, although it works fine in a DOS box under Windows. Also, TAPCIS offers a version that works with INT14, so that it can be run through a modem pool over a network.

Either way (DOS or Windows), the fundamental concept behind TAPCIS is a three-step operation:

1. To begin with, you mark the forums where you want to retrieve messages or entries in a catalog of a software library for file retrieval. At this point, you tell TACPIS what you want it to do when you log into CompuServe (typical tasks include send and receive e-mail, read forum messages, download files, etc.).

2. Once you instruct TAPCIS to go online, it logs into CompuServe and performs all the tasks you've instructed it to do. As soon as it's finished, it automatically logs off (unless you instruct it to stay online for an interactive session).

3. When the material has been retrieved to your PC, you can read and respond to e-mail at your leisure, do likewise with forum messages, and examine the files you've downloaded.

All in all, TAPCIS remains a worthwhile investment (the program costs around $80) simply because it helps you make the most of your time online, and helps keep activity charges to an absolute minimum. Most people who spend more than $20 a month on CompuServe observe that the program pays for itself in six months or less.

For more information on TAPCIS, type GO TAPCIS on CompuServe, where you'll find a copy of TAPCIS ready for download in the libraries, or ask questions of the people who man the forums, many of whom are employees of The Support Group, Inc. (the company that builds and maintains TAPCIS).

A version of TAPCIS is included on this CD-ROM in the Utilities section.

# Online Q & A: Format of CompuServe Questions

**How should I ask questions on CompuServe?**

Let's assume you've located the forum or section that addresses the subject area in which you have a problem or a question. Now that you've located the action, there are a few considerations before you go wild asking questions or looking for help.

Even though you've arrived at the right place, it's important to understand that there's a code of etiquette that governs online behavior. Among other things, it's considered bad form to ask a question that's recently been asked and answered (or whose answer is already on file somewhere). The first thing to do before asking a question is to look around and see if you can find an answer, based on another question.

How do you find this information? It's simple. To start with, read as much of the message traffic as you can that touches on your immediate area of concern (in most cases, the safest course is to read all the messages in the forum section that is most relevant). Also, look in the file libraries for the forum to see if there's a "Frequently Asked Questions" (FAQ) document (sometimes called FAQ), or a summary of current issues and answers. Many times, you'll be able to find just what you're looking for, and no one need be the wiser. If you're looking for patches, fixes, or other software stuff, Library 1, which usually includes "New Patches and Fixes," or other similar listings will help you find the latest and greatest information you're after. Once you've exhausted these resources, you can ask your question with confidence, knowing that the answer probably hasn't already been provided for somebody else.

The other major beef against "newbies" (new users) on CompuServe is that so many tend to write their messages in all upper-case letters. On CompuServe, this is tantamount to SHOUTING, and is therefore frowned upon. Be sure to use upper- and lower-case letters, and watch your spelling and punctuation. It's a lot easier to be taken seriously as a professional if your messages look that way!

Finally, don't expect immediate answers to your questions. It may take hours or even days to get an answer, so you'll have to keep checking in to look for a response. It's also considered bad form to ask for an e-mail reply instead of posting the answer in the forum's message traffic. That's because other people can learn from your questions and the answers, but only if they can see them, too.

# Online Q & A: Finding Information Fast on CompuServe

**What areas on CompuServe are worth investigating?**

CompuServe is a treasure trove of information, but it's also a storehouse for more facts, figures, and files than any one human being could ever absorb. When you're looking for enlightenment, we'd like to recommend a few tools that can help you find what you're after in short order.

The FIND command is probably your best bet when trying to locate the proverbial needle in the haystack. If you're looking for information on IBM, you can try FIND IBM, and then deal with the list of hundreds of related forums and resources that you'll get back in response. If you're looking for other vendors who aren't quite as big or well-represented, you'll either discover that they don't have a CompuServe presence, or get pointed right at the forum and section where they do their business online.

When it comes to Novell- or NetWare-related topics, products, or concerns, NetWire is the place to see and be seen. GO NETWIRE is all it takes to get there, and it will lead you to a plethora of interesting information on all of Novell's products, programs, and services. Using WinCIM, GO NETWIRE produces a top-level menu that covers topics like "What's New," "Technical Services," "File Updates," "Sales & Marketing," "Novell Programs," and "New User Information." If you're new to this area, the latter is a great place to get oriented, and "What's New" is a great place to find out what's going on in the Novell world. (Note: If you're already an Internet user, you can find all this information at http://www.novell.com.)

Several other forums sponsored by magazines exist. Among them are the *NetWare Solutions* Forum (GO NWSFORUM or GO NWSOLUTIONS) and the *LAN Magazine* Forum (GO LANMAG).

If you're looking for a particular file on CompuServe, don't overlook the file finders. PCFF is a PC file finder, and MACFF is a Macintosh file finder. As long as you know the name of the file, or a good description of its contents, you can use these tools to find just about anything you might want, file-wise, on CompuServe.

## Online Q & A: E-Mail on CompuServe

**Can I get to other e-mail services through CompuServe?**

Today, the answer to this question is: "Most emphatically, YES! " If you know the syntax for formatting the To: line in the e-mail address, your CompuServe e-mail can travel to any of the following services:

| | | |
|---|---|---|
| America Online (AOL) | Genie | Prodigy |
| AT&T Mail | Internet | SprintMail |
| BIX and CIX | MCI Mail | X.400 mail systems |
| Fax services | NetWare MHS Servers | cc:Mail |

The key to reaching these e-mail outposts is knowing the details for each system's e-mail formats. For example, messages to the Internet must have an address that reads INTERNET:name@org.com. These details are also available online (if you have WinCIM) in the Help menu for the software. Otherwise, we'd like to recommend a book: *Inside CompuServe* by Richard Wilkins, 3rd. Ed, New Riders, Indianapolis, IN, 1995.

# Online Q & A: Downloading Files from CompuServe

**How can I download a file from CompuServe?**

The answer to this question is: "However the software you're using requires you to perform a download." But, by looking at WinCIM and TAPCIS, we can be a bit more informative. Where WinCIM is concerned, you'll need to start by entering the forum where the file you want is located, or by using PCFF or MACFF to locate the file you're after. Either way, you'll wind up in a library with a pick list of files that you can <span style="color:green">download</span>. All you need to do is highlight and double-click on the file entry you want, or use the Retrieve Marked button to commence downloading.

For TAPCIS, you'll want to instruct it to obtain a catalog for the files in a particular library. This instructs the program to download a list of all the files in a library, organized by sections. Once the catalog is available, you can select that catalog for browsing, and examine one entry at a time. For each file you want to download, strike the D key (for download) as you peruse the catalog. When you've made your selections, instruct TAPCIS to go online and it will automatically retrieve all the files you've flagged.

The real trick is knowing what to do with files once you've downloaded them. On the PC side, you'll quickly observe that most files are stored in a ZIP format, which is a technique used to compress files as tightly as possible. Even though dealing with a compressed file means more work for you, this is a good thing, because it saves downloading time (sometimes substantially). To uncompress a .ZIP file, you'll need the DOS program PKUNZIP.EXE, which may be obtained as a part of the PK204G.EXE file in the PKWARE library, forum PCVENC. We're kind of partial to the WinZIP program, in file WINZIP.ZIP in the file utilities library, forum IBMSYS, because it's able to handle all kinds of UNIX compression formats and runs nicely from Windows, to boot. Macintosh users most commonly use StuffIt and BinHex as compression and upload tools (resulting in filenames that end in .sea.hqx); for these tools, check in forum MACCOM or search on the program names using MACFF.

# Online Q & A: Networking Magazines and Services on CompuServe

**What are some non-Novell resources worth investigating on CompuServe?**

Here again, there's more to cover than we can possibly handle in a Q&A format, so let's agree just to hit some of the high points. We'll cover some cool forums and other information resources in the next few paragraphs.

**NetWare Solutions (GO NWSOLUTIONS or GO NWSFORUM)**
*NetWare Solutions* magazine is an independent publication aimed at NetWare administrators and network managers. It's a treasure trove of useful product information, technical tips and tricks, and more. Online, it offers a wide-ranging discussion forum and access to online help.

**LAN Magazine (GO LANMAG)**
*LAN Magazine* is a monthly networking-focused news magazine. In addition to covering NetWare, LAN Magazine covers the entire networking marketplace. Look to this forum for network news of all kinds, and for tips and tricks on networking products.

**ZiffNet (GO ZiffNet)**
ZiffNet brings together Ziff-Davis Publishing Company's many magazines under one electronic roof on CompuServe, including *PC Magazine*, *PC Week*, *PC Computing*, *Computer Shopper*, *Windows Sources*, and more. Look here for information from these various magazines, and for current news on the computing marketplace in general. ZiffNet members must pay an extra $2.95 monthly for access to these forums, but they're a great source of files, utilities, and other information (including nifty networking and Windows benchmark programs).

**The Computer Library (GO COMPLIB)**
The Computer Library is also published as a monthly CD-ROM subscription (at a hefty $1,295 per year); it includes full-text copies of articles from about forty magazines, with abstracts from over seventy more. A powerful search engine lets you access information by product or company name, author, topic, keyword, publication, and more. This is an extra-charge service, but well worth the money when you're researching products or prices (*Computer Shopper* is an especially valuable resource here).

We could go on forever, but you probably have the idea by now. Look around on CompuServe and you'll definitely find an embarrassment of riches.

## Online Q & A: Subscribing to CompuServe

**How do I reach CompuServe?**

OK, so you're sold on CompuServe. If you want to sign up, there's an easy way to gain access. Inside the U.S., dial Customer Service at (800) 848-8990; they'll help you set up an account, and they can also provide a local access number to dial up. In most parts of the world, you can reach CompuServe through a local access number, so long-distance charges seldom apply.

You can even sign up to CompuServe using your computer. When installing WinCIM or MACCIM, you can select the Sign Me Up icon to begin. You'll need to supply your Agreement Number and Serial Number from the packaging materials, and then you need only make your choice of payment methods to continue. We think this is yet another good reason to make WinCIM or MACCIM a part of your CompuServe toolkit.

If you're on the road and want to stay in touch from outside your normal dialing area, simply enter GO PHONES while you're online. Tell the application the area code or city name where you plan to be and the baud rate for your connection (CompuServe usually offers different numbers for access at 9,600 baud or slower, than for faster speeds; if you have a faster modem, you should definitely use it, so get the number for the higher speeds). Plug that number into WinCIM or TAPCIS right away, so you'll be ready to go online as soon as you arrive at your destination.

# Online Q & A: The Internet for Non-UNIX Users

**Do I need to know UNIX to use the Internet?**

The Internet has strong roots in the UNIX community, so it certainly won't hurt to know something about UNIX when using the Internet, but, thanks to the proliferation of GUI-based Internet access tools in the past three or four years, the real answer to this question is "no."

Nevertheless, there are a few things about the way UNIX works that are helpful to know about. First, there's the way files and directories are named and structured. If you're an old DOS-head, the first thing you'll notice about file names and other references [such as Uniform Resource Locators (URLs) for the World Wide Web (WWW)] is that the slashes go the other way. That is, a fully-qualified pathname for a file will look something like the following:

    /etc/bin/uniform-code-of-justice/info.html

instead of like this:

    C:\etc\bin\ucoj\info.htm

Also, file names in UNIX aren't limited to the 8.3 notation (8 characters for the name; 3 for the extension) that's common for DOS; you'll find names can be up to 128 characters long, and can include lots of elements that would be forbidden in DOS file names.

If you do have to use a terminal emulation program to get Internet access, instead of GUI-based utilities, you can forget everything we just said. In this case, you'll probably be working directly on a UNIX machine, and will have to learn UNIX just to get around. If you're so blessed, we strongly recommend that you obtain a UNIX system manual or two (Such as *Using Unix*, Ackerman, Ernest, et. al., Que, Indianapolis, IN, 1994), and that you learn about the UNIX man command; man is short for manual, and it provides the closest thing to online help UNIX can give you. Just remember: UNIX has been around for over 20 years, so lots of other people have had to learn to get along with it in that time. If they can do it, so can you!

## Online Q & A: Usenet

**What is Usenet, and why should I care?**

Usenet is like a giant bulletin board on the Internet with special interest groups on literally thousands of topics (over 2,000 the last time we checked). Each group on Usenet is called a newsgroup, named according to the Usenet's naming hierarchy and, usually, informatively enough for you to look at the name and decide if you want to subscribe to the group. At that point, you can read some message traffic to see if the action is really interesting or not.

In order to cruise the Usenet newsgroups, you'll need access to a piece of Internet software called a news reader(which is different from an e-mail program, even though some good e-mail programs--most notably, Eudora--can also read newsgroups). Inside this program, you'll be presented with a long list of newsgroups, from which you can select those that interest you. Then, whenever you fire up the news reader program thereafter, you can instruct it to download the traffic that's occurred since the last time you checked in, and you will receive a stream of information that you can peruse or ignore at your leisure.

Newsgroups offer regular listings of user communications on particular topics. If anything, Usenet is a bit easier to use than mailing lists. While they differ from one another and use different syntax for joining and leaving, subscribing to and unsubscribing from Usenet newsgroups is mostly a matter of telling your news reader program that's what you want to do. The key Novell-sponsored or related Usenet newsgroups include the following:

    comp.dcom.lans.novell
    comp.os.netware.announce
    comp.os.netware.connectivity
    comp.os.netware.misc
    comp.os.netware.security
    comp.unix.unixware
    comp.unix.unixware.announce
    comp.unix.unixware.misc
    fido.ger.novell
    fido.novell

There are several networking newsgroups that are not Novell-focused:

    comp.dcom.frame-relay

comp.dcom.isdn
comp.dcom.lans
comp.dcom.lans.ethernet
comp.dcom.lans.fddi
comp.dcom.lans.misc
comp.dcom.lans.token-ring
comp.dcom.modems
comp.dcom.net-management
comp.dcom.servers

If you have a specific question or need to research a specific topic, these are good places to start.

## Online Q & A: The World Wide Web

**What is the World Wide Web (WWW)?**

There's no way we can do justice to the WWW in the context of a Q&A session. In fact, lots of people have written entire books on the subject. Suffice it to say that there are numerous search engines available on the WWW that you can supply with keywords (like NetWare 4.10 or symmetrical multiprocessing) to go off and find all the sites they can locate that contain information matching those terms. This is the most powerful and useful information mining technique we know about; it's changed the way we research and use information. The following lists some of the search engines available:

| | |
|---|---|
| Infoseek | http://www.infoseek.com/ |
| Lycos | http://lycos.cs.cmu.edu/ |
| WebCrawler | http://webcrawler.com |
| Yahoo | http://www.yahoo.com |

In order to use the WWW, you'll need a piece of software called a browser, which is a program that renders and displays the hypertext documents from the Web. Some of the most popular browsers available today include Netscape Navigator from Netscape Communications, Mosaic from the National Center for Supercomputing Applications (or Spyglass, Inc.), and WinWeb from the Enterprise Information Network (EINet), a subsidiary of the Microelectronics and Computing Corp.

Using a Web browser normally requires either a Serial Line Internet Protocol (SLIP) or Point-to-Point Protocol (PPP) connection to the Internet, because your PC needs to send and receive information directly to and from Web servers to do its thing. But there's also another program, called SlipKnot, that can let normal dial-up users run Web browsers. For more details on this software, consult one of the many books on the WWW (we think the SAMS Publishing book, *The World Wide Web Unleashed*, Sam's Publisher, Indianapolis, IN, 1995, 2nd Ed, by John December and Neil Randall, is an especially good tool) or visit any of the following Web locations:

Web Browsers

EINet/WinWeb:
galaxy.einet.net/EINet/WinWeb/WinWebHome.html

NCSA Mosaic:
www.ncsa.uiuc.edu/SDG/Software/Mosaic/NCSAMosaicHome.html

Netscape Navigator:
home.netscape.com/comprod/netscape_nav.html

## SlipKnot

http://www.interport.net/slipknot/whatsnew.html

## Online Q & A: Novell's Presence on the Internet

**What kind of presence does Novell have on the Internet?**

Until about two years ago, the answer to this question would have been "Not much." However, since early 1993, Novell has deliberately increased its presence on the Internet, to the point where literally everything that's available from Novell on CompuServe is also available on the Internet.

Novell's main Internet address is novell.com. This means that you can access a plethora of WWW-based Novell and NetWare information via Novell's Web address, which is http://www.novell.com. It also means that you can dig into the Novell online file library by using the File Transfer Protocol (FTP) program against the address: ftp.novell.com.

Although Novell doesn't sponsor the Usenet newsgroups that cover Novell- and NetWare-related topics, it does support some of the moderators, and it provides technical information and assistance for those moderators who ask Novell for help (very much like Novell's relationship with the NetWire Sysops, in fact). You can also contact Novell technical support via Internet e-mail at the following address: tech-support@novell.com.

# Online Q & A: More Finding Information on the Internet

**How can I find stuff on the Internet?**

There's no easy answer to this question. The problem is related to the famous question from Joseph Heller's *Catch-22*: "How can you see you've got flies in your eyes, if you've got flies in your eyes?" Nevertheless, there are a few tools and techniques you can use to help you find things on the Internet.

We think the best approach is to use the World Wide Web (WWW), and then to access one of the popular search engines [see the list of Uniform Resource Locators (URLs) for addresses]. The key here is in knowing how to search. The technique is to be as specific as possible without striking out altogether. Thus, if you're looking for information about a particular company, start with the full company name. For example, using "Sun Microsystems Inc." will produce more usable results than "Sun," because it will eliminate lots of sites that deal with our closest star, in addition to the computer company of the same name. If you're looking for a particular product, use the product's full name, and if you're looking for information on a topic, try to specify that topic as clearly as possible. For example, if you want information on Northern Italian Cooking, don't simply use "Italian" or "Cooking" as search words.

Other worthwhile tools include <span style="color:green">Archie</span> and <span style="color:green">Veronica</span>, but these are aimed primarily at files and file-based information. There are also lots of printed information guides about the Internet, including White and Yellow pages of many varieties. As long as they're not too old (meaning "stale" or "out of date"), these resources can also point you to some interesting stuff. Don't forget to ask for pointers on the relevant newsgroups or mailing lists, either. Just remember, finding stuff on the Internet is like a lot of other painstaking and time-consuming tasks: Where there's a will, there's a way!

# Online Q & A: Internet Search Engines

**What are some of the Internet search engines?**

There are several Internet search engines. Among them are:

| | |
|---|---|
| Infoseek | http://www.infoseek.com/ |
| Lycos | http://lycos.cs.cmu.edu/ |
| WebCrawler | http://webcrawler.com |
| Yahoo | http://www.yahoo.com |

## Online Q & A: GO Words for Computer Companies and Services on CompuServe

**GO Words for Computer Companies and Services on CompuServe**

Each CompuServe forum has a "GO" word associated with it that takes you directly to the forum. These are the "GO" words for some of the computer companies and services on CompuServe:

**A**

| | |
|---|---|
| A WINCIM Add-on: VOICE E-MAIL | VOICEMAIL |
| A WINCIM Spell-Check | ASPELL |
| APPC Info Exchange Forum + | APPCFORUM |
| AST Forum + | ASTFORUM |
| ATT/NCR + | NCRATT |
| Adaptec Forum + | ADAPTEC |
| Ask3Com + | THREECOM |
| Ask3Com Forum + | ASKFORUM |
| Attachmate Corporation + | ATTACHMATE |
| Attachmate Crosstalk Forum + | XTALK |
| Attachmate Forum + | ATTM |

**B**

| | |
|---|---|
| Bay Networks Forum + | BAYNETWORKS |
| Borland Paradox/Dos Forum + | PDOXDOS |
| Borland Paradox/Windows Forum + | PDOXWIN |
| Borland dBASE for Windows + | DBASEWIN |
| Borland dBASE Forum + | DBASEDOS |
| Btrieve Technologies Forum + | BTRIEVE |

**C**

| | |
|---|---|
| CD-ROM A Vendor Forum + | CDVEN |
| CD-ROM B Vendor Forum + | CDVENB |
| CDROM Forum + | CDROM |
| CIM Support Forums(FREE) | CIMSUPPORT |
| CS Lotus Notes Information Ser (FREE) | NOTES |
| CSNav-Win Support Forum (FREE) | WCSNAVSUP |
| Cabletron System, Inc. + | CTRON |
| Cabletron Systems Forum + | CTRONFORUM |
| Cheyenne Software Forum + | CHEYENNE |
| Citrix Systems Forum + | CITRIX |

| | |
|---|---|
| Comm. & Networking Forum + | INTELFORUM |
| Compaq Connection + | CPQFORUM |
| CompuAdd Forum + | COMPUADD |
| CompuServe Navigator, Windows (FREE) | CSNAV |
| CompuServe Software (FREE) | CISSOFT |
| CompuServe Telnet Access + | TELNET |
| CompuServe WinSupport + | WINSUP |
| Computer Database Plus($) | COMPDB or COMPLIB |
| Computer Reseller News Forum + | CRN |
| Computer Shopper (UK) Forum + | UKSHOPPER |
| Computer Shopper Forum + | COMPSHOPPER |

**D**

| | |
|---|---|
| DBMS Magazine Forum + | DBMSFORUM |
| DOSCIM Information Area (FREE) | DCIMSOFT |
| DOSCIM Support Forum (FREE) | DCIMSUPPORT |
| Da Vinci Forum + | DAVINCI |
| Data Access Corp. Forum + | DACCESS |
| Data Based Advisor Forum + | DBADVISOR |
| Data Based Advisor Mall Store (FREE) | DB |
| Dataquest Online + | DATAQUEST |
| Dell Forum + | DELL |
| Delrina Technology Forum + | DELRINA |
| Digital Equipment Corp. + | DEC |
| Digitalk Database + | DBDIGITALK |

**F**

| | |
|---|---|
| File Transfer Protocol + | FTP |
| Frame Relay Forum + | FRAME |

**G**

| | |
|---|---|
| Gateway 2000 Forum + | GATEWAY |

**H**

| | |
|---|---|
| HP Peripherals Forum + | HPPER |
| Hayes + | HAYES |
| Hayes Online + | HAYFORUM |

**I**

| | |
|---|---|
| IBM COS Network Solution Forum + | IBMCOS |
| IBM Internet Forum + | IBMINET |
| IBM LMU2 Forum + | LMUFORUM |
| IBM Netview Family Forum + | NETVIEW |
| IBM OS/2 B Vendors Forum + | OS2BVEN |
| IBM OS/2 Help Database + | OS2HELP |
| IBM OS/2 Service Pak + | OS2SERV |

| | |
|---|---|
| IBM OS/2 Support Forum + | OS2SUPPORT |
| IBM OS/2 Users Forum + | OS2USER |
| IBM OS/2 Vendor Forum + | OS2AVEN |
| IBM PC Server Forum + | IBMSVR |
| Intel Corporation + | INTEL |
| Internet Club | INETCLUB |
| Internet New Users Forum + | INETFORUM |
| Internet Publishing Forum + | INETPUBLISH |
| Internet Resources Forum + | INETRESOURCE |
| Internet Services | INTERNET |
| Internet World Forum + | IWORLD |

**L**

| | |
|---|---|
| LAN B Vendor Forum + | LANBVEN |
| Lan Magazine Forum + | LANMAG |
| Lan Vendor Forum + | LANVEN |
| Lexmark Forum + | LEXMARK |
| Lotus Communications Forum + | LOTUSCOMM |
| Lotus Technical Library + | LOTUSTECH |

**M**

| | |
|---|---|
| MS Client + | MSCLIENT |
| MS Client Server Comp. Forum + | MSNETWORKS |
| MS DEV Network Forum + | MSDNLIB |
| MS Mail and Workgroups Forum + | MSWGA |
| MS Networks Forum + | MSNETWORKS |
| MS OLE Solutions Forum + | OLESOLNS |
| MS SQL Server Forum + | MSSQL |
| MS WIN32 Forum + | MSWIN32 |
| MS WINFUN Forum + | WINFUN |
| MS WinNT Forum + | WINNT |
| MS WinNT SNA Forum + | MSSNA |
| MS Windows Workgroups Forum + | MSWFWG |
| Mac Communications Forum + | MACCOMM |
| McAfee Virus Forum + | VIRUSFORUM |
| Message Handling Service Hub + | MHSADMIN |
| Microrim Forum + | MICRORIM |
| Microtest Inc. Forum + | MICROTEST |
| Modem Vendor Forum + | MODEMVENDOR |

**N**

| | |
|---|---|
| NCSA Anti-Virus Vendor Forum + | NCSAVEN |
| NCSA InfoSecurity Forum + | NCSAFORUM |
| NCSA SECURITY VENDOR FORUM + | NCSAVENDOR |
| NT Workstation Forum + | NTWORK |
| NetWare Solutions Mag Forum + | NWSFORUM |

| | |
|---|---|
| Nat. Computer Security Assoc. + | NCSA |
| NavCIS Download Area + | WNAVCIS |
| NetLauncher (FREE) | NETLAUNCHER |
| NetLauncher Support Forum (FREE) | NETLAUNCHER |
| NetWare Solutions + | NWSOLUTIONS or NWSFORUM |
| Network Computing Forum + | NWCMAG |
| Network Professional Assoc. + | NPA-1 |
| Network VAR Forum + | STACKS |
| Novell AppTID + | APPTID |
| Novell Client Forum + | NOVCLIENT |
| Novell Connectivity Forum + | NCONNECT |
| Novell DSG Forum + | DRFORUM |
| Novell Dev Support Forum + | NDEVSUPPORT |
| Novell Dev. Info. Forum + | NDEVINFO |
| Novell Files Database + | NOVFILES |
| Novell GroupWise Forum + | GROUPWISE |
| Novell Hardware Forum + | NOVHW |
| Novell InForms Forum + | NINFORMS |
| Novell Information Forum + | NGENERAL |
| Novell Library Forum + | NOVLIB |
| Novell Net. Management Forum + | NOVMAN |
| Novell NetWare 2.x Forum + | NETW2X |
| Novell NetWare 3.x Forum + | NETW3X |
| Novell NetWire + | NOVELL |
| Novell Netware 4.x Forum + | NETW4X |
| Novell OS/2 Forum + | NOVOS2 |
| Novell SoftSolutions Forum + | SOFTSOLUTION |
| Novell Tech Bullet. Dbase + | NTB |
| Novell User Library + | NOVUSER |
| Novell Vendor A Forum + | NVENA |
| Novell Vendor B Forum + | NVENB |

**O**

| | |
|---|---|
| OS/2 CIM Support Forum (FREE) | OCIMSUPPORT |
| OS2 CIM Information Area (FREE) | OS2CIM |
| OZCIS Support Forum + | OZCIS |
| OpenDoc Forum + | OPENDOC |
| Oracle Software Download + | ORASOFT |
| Oracle User Group Forum + | ORAUSER |

**P**

| | |
|---|---|
| PC Plug and Play Forum + | PLUGPLAY |
| PowerBuilder Forum + | PBFORUM |

**Q**

Quarterdeck Forum +                          QUARTERDEC

**S**
Seagate Forum +                              SEAGATE
Standard Microsystems Forum +                SMC
Sybase Forum +                               SYBASE
Symantec AntiVirus Prod. Forum +             SYMVIRUS
Symantec Applications Forum +                SYMAPPS
Symantec Norton Util. Forum +                SYMUTIL
Symantec Ntwrk Products Forum +              SYMNET

**T**
TAPCIS Forum +                               TAPCIS
Thomas-Conrad Forum +                        TCCFORUM

**U**
UnixWare Forum +                             UNIXWARE

**V**
VARBusiness Forum +                          VARBUSINESS

**W**
WRQ/Reflection Forum +                       WRQFORUM
WUGNET Forum +                               WUGNET
WINCIM General Forum (FREE)                  WCIMGENERAL
WINCIM Information                            WINCIM
WINCIM Technical Forum (FREE)                WCIMTECH
WinNav Information +                          WINNAV
Windows Connectivity Forum +                 WINCON
Windows Networking A Forum +                 WINETA

**X**
Xircom Forum +                               XIRCOM

**Z**
Ziff Bendata Forum +                         BENDATA

## Online Services Network Utilities

[Close-Up/LAN Pro v6.1 and Close-Up from Norton-Lambert](#)

[CompuServe Information Manager for Windows--WinCIM 1.4 Novell Edition](#)

[CompuServe NetLauncher](#)

[TAPCIS from the Support Group](#)

## Online Services Utilities: CompuServe Information Manager for Windows--WinCIM 1.4 Novell Edition

WinCIM is Windows-based access software for CompuServe.

To install this software, copy the directory D:\PROGRAMS\WINCIM to your hard disk. Then run the SETUP program from the Windows Program Manager File Run command line. If your hard disk is designated as drive C, type C:\WINCIM\ SETUP.EXE and choose OK.

## Online Services Utilities: CompuServe NetLauncher



NetLauncher is Internet access software for CompuServe.

To install this software, copy the directory D:\PROGRAMS\NETLAUNC to your hard disk. Then run the SETUP program from the Windows Program Manager File Run command line. If your CD-ROM drive is designated as drive D, type D:\ NETLAUNC\SETUP.EXE and choose OK.

## Online Services Utilities: Close-Up/LAN Pro v6.1 and   Close-Up from Norton-Lambert

This evaluation is a timed evaluation that includes two fully running programs; the Close-Up modem remote communications package and the Close-Up LAN Pro network remote communications package. Users can demo the Close-Up modem product, the Close-Up/LAN Pro network product, or both products simultaneously.

A README file is included that is a quick manual and reference guide for operating both Close-Up and Close-Up/LAN Pro modem and network programs.


Requirements:

Hardware: IBM PCs, ATs, XTs, PS/2s, and 100% compatibles.
Operating System: MS or PC DOS 3.3 or later. Windows (Optional): Windows 3.1 or 3.11. Windows for Workgroups 3.11.
Mouse (optional): Microsoft mouse and 100 percent compatibles
Network (optional): NetWare and all popular networks
Modems: Point and   Select from over 800 modems
Monitors: Monochrome through SVGA
Memory: Close-Up Host 0K (with UMB's) or 42KB, remote 375KB
Close-Up/LAN Pro Host 0K (with UMB's) or 47KB, remote 375KB
Hard disk: Recommended
**Note**: Requires 2 machines to establish a remote connection


Installation:

To install, copy the directory D:\PROGRAMS\NORTON to your hard disk. Type CINSTALL at the DOS prompt.

# Online Services Utilities: TAPCIS from the Support Group

TAPCIS is an access program for CompuServe that allows you to automate the work you would normally do manually such as reading messages and writing messages, sending and retrieving e-mail, and downloading and uploading files.

To install this software, copy the directory D:\PROGRAMS\TAPCIS to your hard disk. Then run the TAPTRY.EXE program from DOS. If your hard drive is designated as drive C, type C:\TAPCIS\TAPTRY.EXE and choose OK.

**Education and Support**

# CD HELPdesk Series: Novell Products

### Click on any icon for more information

# Education and Support Q & A

[What are some of the tasks the Implementation team will need to consider?](#)

[What are some of the ways to notify technicians that a problem is in their Queue?](#)

[What are some questions to consider for the helpdesk project scope?](#)

[What are some questions to ponder before choosing a helpdesk software program or system?](#)

[What are the different ways to notify support personnel of tickets?](#)

[What are the logistics of a helpdesk?](#)

[What are the systems environment concerns and problems for medium and large companies with WANs at several sites?](#)

[What equipment will the NCC--(Network Control Center) monitor?](#)

[What is a helpdesk?](#)

[What role can management take to ensure a successful helpdesk for the organization?](#)

[What things can I remember to make a helpdesk operation flow smoothly?](#)

[What type of software does a small company need?](#)

[Whom can I call to get information on setting up a helpdesk?](#)

## Education and Support Q & A: What role can management take to ensure a successful helpdesk for the organization?

**What role can management take to insure a successful helpdesk for the organization?**

Management must support the concept of a helpdesk and fully understand the need to give quality support and timely assistance to the customer.

Management must give authority and decision-making capabilities to the help desk support team to manage the new responsibilities to ensure rapid response to customer problems.

## Education and Support Q & A: Whom can I call to get information on setting up a helpdesk?

**Whom can I call to get information on setting up a helpdesk?**

The Help Desk Institute conducts seminars and can provide valuable information for problems ranging from setting up a helpdesk to staffing issues. Call (719) 531-5138 or (800) 248-5667.

## Education and Support Q & A: What is a helpdesk?

**What is a helpdesk?**

A helpdesk is an automated system provided by an MIS department to its customers to aid both the customer and MIS in solving computer-related problems.

It provides a single point of entry for users or customers to report s   problems related to computing (hardware or software, printing, networking, and communications).

It assists the MIS organization in better allocating technical resources by automating and prioritizing work requests.

# Education and Support Q & A: How does a helpdesk work?

**How does a helpdesk work?**

A customer reports computer-related problems to a centralized helpdesk.

The customer explains the problem to the helpdesk personnel.

Helpdesk personnel create a trouble ticket by entering the problem into a helpdesk system or problem-tracking system.

The system assigns the trouble ticket a tracking number that includes a time and date stamp.

The helpdesk personnel place a priority on the ticket in relation to other tickets already in the system.

The ticket is then sent to an appropriate technician to service the call.

If a technician does not acknowledge the ticket within a set time frame, the helpdesk system can automatically upgrade the priority or route the ticket to another technician.

Once the technician acknowledges receipt of a ticket, helpdesk procedure should require the technician to notify the customer of the ticket status.

If the helpdesk system is integrated with asset management tracking, a technician can retrieve customer and computer asset information from the system database relating to the customer's workstation. This eliminates the need for technicians to physically go to the customer's workstation to find out what type of equipment, software, and configurations the customer has.

If the technician determines that the customer's problem requires equipment to be ordered or replaced, the technician informs the customer of the approximate time it will take to receive and complete the work.

Once a problem is resolved, technicians can enter the problem resolution into the helpdesk system and close out the ticket.

## Education and Support Q & A: What are some of the ways to notify technicians that a problem is in their Queue?

**What are some of the ways to notify technicians that a problem is in their queue?**

ICON--Built-in ticket notification modules in some helpdesk software packages provide an icon that appears on the technician's screen .

E-mail--The system sends an e-mail notification to technicians alerting them of new tickets. This method assumes that technicians continually monitor e-mail for new tickets.

Voice Recognition Units (VRUs)--This option sends a voice message to a technician's phone.

Pagers--Some helpdesk systems provide automatic paging to individuals, groups, or teams. In addition, the helpdesk support team can manually page technicians if the system does not permit this option.

Phone Notification--Helpdesk personnel notify technicians directly by phone.

## Education and Support Q & A: What are some features of a helpdesk?



**What are some features of a helpdesk?**



E-mail notification and follow-up--Most helpdesk software interfaces with some type of e-mail system for sending tickets directly to the technician for notification. This provides additional benefits to the customer because the technician can:

- Send notes to the user letting them know how to resolve simple problems.

- Inform the customer when the technician will be available to service the call.

- Inform the customer that equipment must be ordered and the time-frame for receiving and installing the equipment.

Customer reporting and surveys--Systems that interface with e-mail can permit the customer to:

- Send requests or problems directly to the helpdesk.

- Fill out a survey grading the helpdesk on its customer service and quality of work.

Centralized tracking--In some cases, the problem will involve several technicians to solve the problem. Centralized tracking of the customer's problem can provide a forum for the technicians to:

- Keep each other informed of his or her progress in the resolution of the problem.

- close the call and record the actual steps taken to resolve the problem.

Expert systems capability--Some systems (the expensive ones, usually) provide expert systems capability such as artificial intelligence or decision tree, with problem-resolution databases, such as CASE, Expert, and Knowledgebase systems. This enables non-technical helpdesk personnel to use the expert knowledge in the system to resolve calls without having to transfer the ticket to a

technician.

Reporting--Most helpdesk products provide built-in canned reports that management can use to see at a glance some of the common problems or bottlenecks in certain service areas including the following:

- The number of calls open and closed

- The types of problems called in

- The workload of individual technicians

- The repetitive hardware or software problems

- The time it takes a technician to resolve problems or notify the users

These reports allow management to make better decisions on equipment usage, repair service, helpdesk response time to users, and if users or the technicians need training in certain areas.

# Education and Support Q & A: What are the logistics of a helpdesk?

**What are the logistics of a helpdesk?**

Depending on the size and needs of an organization, setting up a helpdesk can proceed from simple to complex. The cost associated with setting up a helpdesk can be just as complex to figure out or foresee.

Implementation Considerations
The duration of a helpdesk implementation may take from one month to a year. Some factors that determine the length of time include the following:

- The size of an organization

- The users' knowledge of computers and the current software in use

- The complexity of the helpdesk software to be installed

- The amount of training needed for the customers and for the technicians supporting the helpdesk

**Data Input (Customer & Asset Information)**
An organization may need to hire or contract additional staff to input inventory information into the helpdesk system, if an automated LAN inventory system is not in use. Some of this information includes personnel information as well as equipment and workstation configurations.

**Determination of Database Definition**
The helpdesk implementation team needs to identify master codes used for the different database fields. The team may find that not all the fields meet their specific business needs. Some factors to consider include the following:

- Can the database field sizes, labels, or formats be changed easily?

- Will the vendor be willing or able to adapt its software to the company needs?

- Will the vendor continue to support the software if it is customized to fit the organization's needs?

- How many technicians will it take to plan, develop, test, and implement the helpdesk software?

- How many technicians will it take for post-implementation support?

- How much administrative support will it take to develop procedures and oversee the helpdesk function?

- How much training will be needed for technical support and customers on how to use the help desk system?


**Structure of the IT support**
Considerations about teams or groups for hardware and software, LAN/WAN, communication, and applications will determine the configuration and makeup of the support desk.

## Education and Support Q & A: What are some questions to ponder before choosing a helpdesk software program or system?

**What are some questions to ponder before choosing a helpdesk software program or system?**

What type of environment do you currently have (i.e., type of LAN, operating systems or environments such as Windows, DOS, or OS/2)?

Does your company have a standards policy on software, hardware, and workstation configurations? Organizations plan and use only certain software packages, hardware equipment, and software configurations.

Are the users computer literate (How much training will they need for changes made to the current hardware and software in use)?

Will you need to upgrade your computers or network before you can implement a helpdesk?

Who will make up the team to decide what type of helpdesk to create?
A recommendation is to include end-users from different departments and IT personnel with varying areas of expertise. Not only does this help the customer better understand the system, it also helps the customers make the transition to the changes being made in their work environment.

Who will operate the helpdesk? Data entry clerks or IT technicians?

Will the helpdesk software be included or be interfaced with an asset tracking system?

Can the software be easily modified to fit the organizations needs (i.e., changing field types, sizes, and labels)?

Will the helpdesk software have or interface with a query system for quick lookup and search capabilities for problem resolution?

What will be the cost of training the helpdesk personnel?

What is the cost of shrink-wrapped online software support from the vendor?

What is the average time the customer or technician spends in the queue waiting

for support personnel to answer or resolve the problem or question?

Will the vendor provide an 800 number for support?

Will the initial information (i.e., personnel, location, hardware and software and, workstation configurations), be input manually or via an automated LAN auditing program?

What is the license cost to purchase helpdesk software for individual copies, site license (one-user to unlimited use), or an organizational license with a multi-site use?

What software will the management team use? (i.e., a simple complaint system or a full-blown Helpdesk and Automated Asset Management Tracking System)?

Who will install the helpdesk software: vendor or IT technicians?

## Education and Support Q & A: General Implementation (Regardless of Organizational Size)

**What Do I Need To Know About the General Implementation of Help Desks?**

The duration of the implementation may take from one month to a year. Establish a full-time implementation team to coordinate the installation and uniformity of applications, data fields, policies, and procedures. The post-installation team should consist of some of the same people, who provide ongoing support after the installation for the consistent flow of experience and knowledge during and after the transition. Recommend that the vendor install the helpdesk software at each site (especially if different network operating systems exist). The vendor installation should involve the IT staff.

## Education and Support Q & A: What are some of the tasks the implementation team will need to consider?

**What are some of the tasks the Implementation team will need to consider?**

Determine the overall tactical implementation of the helpdesk and asset management (the size of the company, who will install the software, choice of software, what platform will run the helpdesk software, etc.), including the following:

Workstation and server

- Network operating system

- Operating system

- Network adapter description

- Protocol

Hardware requirements

- Hard disk space

- RAM

- Processor

Define the configurations by components and subcomponents for the equipment and its features, the wiring paths (jacks), and the customer's information. Consider the following:

Reports
- Canned

- Ad-hoc

Query capabilities
- Sort and search

- Contextual


Graphics


Audit trail security


Define as many master codes as possible as you work with the organizational work flow. This forces the team to determine the relevant codes for the organization, which will enable data entry in the major modules to go much more quickly.

Monitor the ongoing strategic development (use of Gant charts, etc.) to make sure the project is within the cost and time limit set to complete.

Test different software packages, using a format containing what the organization wants, expects, or is getting.


The following questions concern ease of installation:

- Is the installation and use of the software intuitive?

- How long does it take to install the software?


Determine vendor support during the installation.

Develop an implementation plan.

Choose the helpdesk software to install.

Decide who will install the helpdesk software.

Establish a timeframe for implementation.

Resolve training issues before the implementation.

Address post-implementation training needs.

Provide information to the customers on the following:

- What the helpdesk will provide.

- How it will work.

- Documentation on what to do and whom to .

- Helpdesk hours of operation.

- Any other information that will ease the transition for the customer.

Determine where to implement and test the helpdesk software first, if the organization is planning to implement the software at multiple sites.

Choose a centralized phone number for customers to call.

Select an easy number to remember (i.e., 235-help).

Depending on your phone system, you may need roll-over numbers, huntgroups, or an ACD menu system.

Coordinate the development of a central database repository.

Select the primary vendor interface. This IT person will also supervise the vendor installation.

Test the helpdesk application at a pilot site first if multi-sites are included in the installation.

If the team implements the helpdesk software at only one site, test a small group or department first, before installing the application throughout the organization.

The vendor and implementation team should provide technical assistance to sites before and after the installation.

## Education and Support Q & A: What type of software does a small company need?

**What type of software does a small company need?**

Depending on the number of computers and the environment, some small companies may only require a helpdesk software package to track problems that an on-site technician can resolve. The software may:

track common and/or recurring problems or questions.
query capabilities for quick problem resolution.
include graphics capabilities for presentations.
produce canned reports.

Some systems for small organizations include the following:

- *Harrington Group's Corrective Actions*--a Microsoft Access Windows database that supports customer complaints and problem resolution tracking.

- The LAN Support Group's BindView--can track network and desktop software and hardware information, as well as network and desktop configurations.

- Blue Lance's LT Auditor and LT Helpdesk--provide network audit and helpdesk software.

## Education and Support Q & A: What items should medium to large companies who have multiple sites and overseas locations consider?

**What items should medium to large companies, who have multiple sites and overseas locations consider?**

Should the organization consolidate data into one large database or have each site maintain its own database?

How should organizations pull information from the different sites together into one report for the asset tracking and cost reporting of equipment, maintenance, repair, replacement, and disposal?

How should organizations pull together information if the helpdesk is centralized and the location of the asset tracking system is at individual sites?

Does the system work efficiently in a LAN/WAN environment, utilizing existing bandwidth requirements?

## Education and Support Q & A: What are the systems environment concerns and problems for medium and large companies with WANs at several sites?

**What are the systems environment concerns and problems for medium and large companies with WANs at several sites?**

Considerations for WANs include the following:

- The protocol used for LAN/WAN

- Use of TCP/IP addressing for remote networks

- LAN/WAN server monitoring and diagnostic capabilities

- Well-defined network management procedures

- Diagnosis of LAN/WAN problems using remote analyzers

- Vendor and third party information sources to help problem resolution

- Diagnostic tools that show activity and problems with communications architecture to enable real-time monitoring of client networks (Network General's Sniffer, Cabletron's LANVIEW over HP Openview, etc.).

## Education and Support Q & A: What equipment will the Network Control Center (NCC) monitor?

**What equipment will the NCC--(Network Control Center) monitor?**

These are some of the elements to monitor:

Routers
Bridges
Cabling hubs
CSU/DSU
Network adapters
Workstations
Network servers
Gateway servers
E-mail servers
Terminal servers for dial-up access
Dial in/out modems
Applications (software and license)
Telephone switches
Phonemail system

## Education and Support Q & A: What are some different helpdesk combinations?

**What are some different helpdesk combinations?**

On-site helpdesk--On-site, with some areas of support out-sourced to an outside vendor

Out-sourced helpdesk--Out-sourced helpdesk with a small helpdesk for problems that have to be handled by on-site technicians

Large centralized helpdesk--With distributed customer support systems that trickle down help for the customer.

One such setup is to have customers from all company sites call one centralized helpdesk. If the support personnel cannot immediately resolve the problem, they send a ticket to the main IT (secondary) support group. If secondary support cannot resolve the problem, the ticket routes directly back to the original call-in site for local support to resolve the problem.

* All of the above may or may not have an asset tracking system in place.

Proper codes and good communication among the central helpdesk, secondary support, and the local site allow the work or problem request to flow easily. This will eliminate user concern where help is coming from.

## Education and Support Q & A: What things can I remember to make a helpdesk operation flow smoothly?

**What things can I remember to make a helpdesk operation flow smoothly?**

Always call customers back to let them know you have received the work-order request.

Let the customer know if you need to forward the ticket to someone else.

Give customers an estimate of how long it will be before you can help them, and set up a time to work on the problem.

List all hardware, software, and LAN/WAN configurations, mainframes, etc., within each site and used by all sites, with the equipment located at a remote site.

Make a list of who supports what equipment, programs, and software.

Draw a data flow diagram to show how the problem or request will flow through the system for resolution, and by what groups.

Keep information current among all support areas: the central helpdesk, secondary support, and the local sites.

Always treat each customer as if he or she were the president of the company.

## Education and Support Q & A: What are the different ways to notify support personnel of tickets?

**What are the different ways to notify support personnel of tickets?**

Voice Recondition Units (VRUs): Used to send telephone messages to the support staff's phone, with a message that there is an outstanding ticket in his or her queue.

Beepers (individual and group): Depending on the makeup of your support staff, use alphanumeric beepers to notify a team member that a ticket is awaiting action from someone on his or her team. To locate support staff, since they are usually away from their desk supporting customers, in emergencies an individual beeper is useful.

E-Mail: Most newer helpdesk support software now has e-mail integrated into the notification system. Use e-mail to notify support persons of any outstanding ticket in their queue or of a referral ticket from another support member.

Phone or phonemail: Call the support person directly. If he or she is not available and the problem is not urgent, leave a phonemail message in his or her mailbox.

## Education and Support Q & A: What are some of the cost benefits of having a helpdesk?

**What are some of the cost benefits of having a helpdesk?**

A helpdesk can build a resolution database for quick assistance to users.

Module add-ons will allow management to make quicker, more informed decisions.

Complete automated microcomputer asset tracking

Purchasing

Inventory

Network and workstation configurations

Equipment replacement

The communications area for wiring paths from the jack to the router

Support personnel do not have to go to each workstation physically to see what type of equipment or configuration is present. They can access the helpdesk database interfaced with the asset tracking module.

A helpdesk allows a company to:

- reduce time to locate information needed to resolve problems, using query tools.

- reduce staff time needed to support customers or eliminate redundant support from more than one technician. In some cases, companies may be able to reduce their staff.

- improve efficiency and create more effective customer service.

## Education and Support Q & A: What are some of the costs and concerns of setting up a helpdesk?

**What are some of the costs and concerns of setting up a helpdesk?**

Cost

Training

Software

Vendor online support contracts

Cost of long-distance calls and waiting in the queue for vendor technician support

Adding staff to answer helpdesk calls; possible use of data entry clerk rather than technical staff

Large range in the cost of helpdesk software

Using IT staff members to write or input information into a decision-tree-type database or adding an AI or expert system for quick query capabilities

Staffing concerns

Helpdesk personnel burn-out

Use of data-entry personnel or first-line helpdesk technicians

Centralization or decentralization of the helpdesk personnel

Type of database application the organization will need (i.e., Microsoft SQL, Sybase, Oracle, or Windows environment)

Converting and keeping up with the changing environments

## Education and Support Q & A: What are some questions to consider for the helpdesk project scope?

**What are some questions to consider for the helpdesk project scope?**

What services will the helpdesk render to the customers?

Who are your users, and what are their skill levels on the current workstations and software?

How much support will your customers need?

What does your organization want from a helpdesk software package?

Will there be room for growth? Is the package modular, and/or does it use partnering for expert systems, interfacing with e-mail, etc.?

Will the vendor assist in the installation of the helpdesk software?

Is there good documentation for the helpdesk software?

Will the software vendor provide online assistance for questions about the software free or through a support contract?

What are the computer installation and configuration standards throughout the organization?

What type of hardware and software is in use throughout the organization?

What is the customer involvement and expectations for the helpdesk support?

Avoid the black hole; provide a call-back policy for the helpdesk staff and technicians to the customer.

Will the helpdesk have a single telephone number for the customer to call?

What are the online shrink-wrapped applications that vendors and/or the technicians support?

How will the helpdesk provide support and service request for adds, moves, and changes that will include several different teams (i.e., LAN, telephones,

hardware, printers, faxes)?

Who will perform first-level support for LAN/WAN trouble-shooting activities?

Will the helpdesk software allow staff to log all reported problems into a helpdesk database system?

Will the helpdesk software allow staff to escalate problems according to pre-established policy and procedures?

Does the helpdesk software allow for problem transfer to the adequate technician or team, assigning ultimate responsibility for satisfactory closure of the problem call?

Does the helpdesk allow for the use of e-mail to notify technicians of new tickets in the queue or VRUs for phone messages or group/individual beepers?

Will there be a proactive information feedback policy to customers?

## Education and Support Q & A: Reports--what can they tell you about your current level of service?

**Reports--what can they tell you about your current level of service?**

Cost associated with support and equipment maintenance

Annual cost of equipment purchases

Time spent on service calls

Type of problems called into the helpdesk

Query most common problems

Query the call history by customer, group, or problem type

Training needs for customers

Training needs for technicians on hardware and software updates and changes

Hardware replacement problems or common repairs

Wiring path bottlenecks

Time spent on moves, adds, and changes

Forecasting for budget

Ability to make better-informed decisions on critical issues facing the management of information systems in today's fast-changing environment

Department charge-back for support and equipment usage

## Education and Support Q & A: Some added info and places to look for information on helpdesk and expert systems.

**What are some of the helpdesk tools available?**

These are some tools and helpful sources of information on helpdesk systems.

*KnowledgeBroker Inc., Irving, TX--HelpTrak, a Windows-based call-tracking and problem management system for monitoring customer information and problem solutions. Ask.Mes, or a Windows-based problem resolution software program for end users and help desk personnel. Call (800)829-4524 for more information.

*Bendata Inc.--A Window-based knowledge product, First Level Support for Windows is designed to enhance productivity at the helpdesk by providing online answers and information to end-users. For more information, call (800)776-7889, ext. 219.

# Education and Support Q & A: The NPA...An Overview

**What is the NPA?**

The Network Professional Association, the NPA, puts the latest technology into the hands of all of its members. The NPA also provides extensive opportunities to interact with other network professionals so no one ever stands alone. By offering all this and other quality member services, the NPA is the hands-on network for you.

The NPA is a self-regulating, non-profit association of network computing professionals that sets standards of technical expertise and professionalism. The mission of the NPA is to advance the network computing profession. The NPA is governed by a member-elected, independent Board of Directors and has over 11,000 members and more than 100 established chapters worldwide.

# Education and Support Q & A: Who is the NPA for?

**Who is the NPA for?**

The NPA is for network professionals--those who design, implement, and/or maintain computer networks--who want to keep up with the latest technology and information in the industry. Membership in the NPA is open to all individuals who have any of the following certifications: Certified Novell Engineer (CNE) and Enterprise Certified Novell Engineer (ECNE), Certified Banyan Engineer (CBE), Certified Banyan Specialist (CBS), Microsoft Certified Systems Engineer (MCSE), Compaq Accredited Systems Engineer (ASE), and IBM Certified LANServer Engineer.

Associate memberships are also available to individuals who have any of the following certifications: Certified Novell Administrator (CNA), Certified Lotus Professional (CLP), Microsoft Certified Product Specialist (MCPS), and Certified Network Expert (CNX). Associate memberships are also available to individuals who have begun the CNE, CBS, MCSE, ASE, or LAN Server Engineer certification process.

## Education and Support Q & A: What does the NPA do?

**What does the NPA do?**

Mainly, two things. First, the NPA identifies the common needs and interests of network professionals and then builds programs and initiatives to meet those needs. Secondly, the NPA delivers the most current technology and information to its members through strategic alliances with multiple industry-leading vendors.

## Education and Support Q & A: You're in Good Company...NPA Sponsors

**Who are the NPA sponsors?**

You're among industry leaders with the following companies who sponsor the NPA:

APC
Azure Technologies
Banyan
Blue Lance
Cheyenne
Compaq
CompuServe
Firefox
Folio
Hewlett-Packard
IBM
Internet Junction
Lotus
Mc Afee
Micro House
Micro Test
Microsoft
Network General
Novell

## Education and Support Q & A: Join Today!

**How do I join?**

Joining the NPA is the right thing to do for network service professionals--hands down. So, why not put your hands to work right now and fill out the attached application and mail or fax it today? Or call (801) 379-0330 for more information.

## Education and Support Q & A: NPA Announces Certified Network Professional™ Program

Association Unveils Industry Professional Certification At Integrate[a] Conference

Provo, UT, August 15, 1995--The Network Professional Association (NPA) today announced the creation of a new industry professional certification designed to differentiate network professionals from other service providers. The NPA's Certified Network Professional (CNP) program is for individuals who design, integrate, manage and maintain networked computing environments as a career.

"Organizations need an independent benchmark to identify individuals with a consistent level of network competency," said Karen Kocher, training manager, The Aetna. "Because the Certified Network Professional program measures vendor-independent networking skills, corporations can be confident when they hire a CNP they are getting a qualified and experienced professional.

The CNP program creation has been a team effort, developed with the help of 450 NPA members and other training and certification experts in the industry over the past two years. NPA members and representatives from education channels, industry associations, computer vendors, testing organizations and curriculum developers have been part of the effort.

"Network professionals have been asking for a professional certification," said Brent Done, certification director for the NPA, "one that rewards not only competency but also requires experience, professionalism, ethics and continuing education. They need a certification that supports what they do and accurately reflects who they are."

The CNP is comprised of a core fundamentals exam that spans the five basic areas of the network: microcomputer hardware platforms, client operating systems, network operating system fundamentals, protocols and topologies. CNP candidates are required to pass the core exam and complete any two of the following product certifications (each of the two certifications must be from different vendors):

| | |
|---|---|
| Banyan | Certified Banyan Engineer |
| CNX Consortium | Certified Network Expert (all versions) |
| Compaq | Accredited Systems Engineer (all versions) |
| IBM | Certified LAN Server Engineer<br>Professional Systems Engineer |

| Lotus | Certified Lotus Professional |
| Microsoft | Certified Systems Engineer |
| Novell | Certified Novell Engineer |
| | Master Certified Novell Engineer |
| | Enterprise Certified Novell Engineer |

"The Network Professional Association (NPA) is committed to delivering an independent professional certification," added Cosette Dicker, a member of the NPA Board of Directors. "The industry professional certification complements existing vendor certifications, while adding the components needed by network professionals."

In addition to passing the core fundamentals exam, CNP candidates must demonstrate at least two years of requisite work experience and complete a professionalism and ethics module that requires the signing of a professional code of ethics. Once a candidate becomes a CNP, he or she must recertify each year, following an extensive program of continuing education and activity requirements.

"Network professionals need a credential that accurately reflects their level of competency, experience and commitment," said Fitz Stewart, Chair of the NPA's Certification Review Council. "CNP is designed to do all this plus require professionals to keep their certification current year after year."

The CNP program includes a core fundamental exam developed by Drake Prometric of St. Paul, Minn in cooperation with 150 NPA members. This exam will be beta tested during the NPA's Integrate conference, using network professionals as test takers. Core fundamental objectives for CNP have been validated by the Institute for Computer Uses and Education (ICUE) of Orem, Utah. The program has been designed to meet the professional certification guidelines outlined by the National Organization for Competency Assurance (NOCA).

The NPA will release the validated core fundamental objectives to third party curriculum developers. Once approved, the NPA will endorse curriculum as recommended preparation for taking the core exam. To date, six curriculum developers have agreed to create courseware mapping to CNP core fundamental objectives.

Computer vendors such as Compaq and IBM are supporting the CNP program by recommending that their certification candidates consider becoming CNP's in the process of obtaining their product-specific certifications. Other vendors plan

to build product certifications to fit within the Areas of Specialty portion of the CNP model.

The NPA is a self-regulating, non-profit association of network computing professionals that sets standards of technical expertise and professionalism. The NPA delivers on its mission of advancing the network computing profession by keeping its 12,000 members in more than 110 chapters worldwide current with the latest technology advancements.

For more information contact:
Bruce K. Law                     Sherri Walkenhorst
NPA Marketing Director           Network Associates
801-379-0271                     801-373-7888

The Network Professional Association (NPA) puts the latest technology into the hands of its members. The NPA provides extensive opportunities to interact with other network professionals. By offering this and other quality member services, the NPA is your hands-on network. NPA membership has many benefits, from direct access to the latest information to product discounts. NPA members can participate in programs and opportunities specifically designed to fit the needs of the network professional including:

**Peer Interaction and Strategic Contacts**
NPA members have tremendous opportunities to interact with other network professionals whether locally or on a national level at trades shows and conferences. NPA members meet with other local chapter members to discuss mutual interests, exchange solutions, and evaluate products. This networking also allows NPA members to make strategic contacts in the industry, the networking profession, and specialized areas of networking technology.

**NPA Hands-on Technology Labs[a]**
NPA Hands-on Technology Labs are highly technical, highly educational forums that let you experience network computing products as they are connected in a laboratory environment. These labs bring hardware and software right to NPA members through presentations and hand-on exercises. NPA Hands-on Technology Labs take place at major industry trade shows and other locations worldwide as sponsored by local NPA chapters.

**Product Discounts**
Many of our sponsors provide free evaluation products and/or substantial discounts on hardware and software exclusively to NPA members. Last year the NPA provided more than $2 million in free network related products to its

members. Other discounts available to NPA members include group insurance rates, express delivery services, paging voicemail and mobile fax services, credit cards, travel and lodging, car rental, and more!

**NPA Forum on CompuServe¨**
The NPA has its own forum on CompuServe. This is the official NPA electronic communication systemÐa place where all NPA members can meet, exchange ideas, and keep up-to-date with NPA happeningsÐall online. Just type GO NPA from any CIS prompt and you can access the NPA home screen. Only NPA members can access the NPA Member Forum for all types of technical information and networking with other network professionals.

**Network News[a]**
All NPA members receive a free subscription to the Network NewsÐa $48 value. Published monthly, the Network News features technical articles on leading topics in the network computing industry, as well as articles on network troubleshooting, professional development, and NPA news.

**Technical Conferences and Training**
NPA members have many chances to enhance their careers through conferences and job fairs. NPA Connect[a] is a program that brings trade shows and career fairs to local chapters and regions. On a national level, Integrate[a] Ñthe NPA's professional technical conferenceÑbrings vendors, their technology, and NPA members together. NPA members may register in advance and are offered significant discounts to Integrate.

**NPA Member Recognition**
When you join the NPA you receive a complete membership kit and membership card identifying you as a member of the Association. You may also use the official NPA member logo on your correspondence, business cards, etc.

**Industry Influence**
Help guide the direction of the network computing industry. The NPA is where professionals can unite their voices and be heard. Because industry vendors recognize the NPA's influence and respect its input, the NPA's recommendations can impact the industry. So when you join the NPA, you are not only empowered to help yourself, but your profession also.

**Professional Development**
The NPA provides you with several opportunities for pro-

fessional growth and personal development. By partic-ipating in your local NPA chapter, you have numerous chances to develop skills in leadership, communication, management, fund raising, organization, or public relations. The NPA also opens many avenues through which industry recognition and involvement are made easier.

# Education and Support Q & A: Joining the NPA

**How do I join the NPA?**

**Network Professional Association Membership Application**

Please mark all responses with an (**X**)

**TYPE OF MEMBERSHIP**
( )Full Membership ($150 (US) per year)
( )Associate Membership ($150 (US) per year)

**CERTIFICATION**
Full membership in the NPA is open to all individuals who have one or more of the following ceritifications: (Check all that apply)
( )Banyan CBE
( )Banyan CBS
( )Compaq ASE
( )IBM CLSE
( )Microsoft MCSE
( )Novell CNE
( )Novell ECNE

Associate membership in the NPA is available to those inprocess of or who have attained certifications from the following list: (Check all that apply)
( )Certified Network Expert (CNX)
( )Lotus CLP
( )Microsoft CPS
( )Novell CNA
( )Banyan CBE in process
( )Banyan CBS in process
( )Novell CNE in process
( )Microsoft MCSE in process

**Please indicate the chapter you would like to attend:**
 (listing available on CompuServe: GO NPA, guest forum)

**MEMBER INFORMATION**
Send Mail to:
( )Home Address( )Work Address

**Last Name:**

**First Name:**

**Home Address:**

**City:**

**State:**

**ZIP:**

**Country:**

**Home Phone:**

**Home Fax:**

**Employer/Company Name:**

**Work Address:**

**City:**

**State:**

**ZIP:**

**Country:**

**Work Phone:**

**Work Fax:**

**CompuServe/Internet Address:**

**Age Group:**
( )Under 20 ( ) 20-30 ( )31-40 ( )41-50 ( )0ver 50

**Are you currently employeed as a network professional:**
( )Yes ( )No

**Which best describes your job function:**
( )Network/Lan Management
( )MIS/DP/IS Management
( )Consulting

( )Administration/Management
( ) Technical Services
( ) Education/Training
( )Research/Development
( )Systems/Engineering/Integration
( )Other:

**PAYMENT** (Payment must accompany applicationÐUS Dollars Only)
( )Money Order
( )Check
( )Mastercard
( )Visa
( )American Express

**Card:**

**Expiration Date:**

**Member Signature:**


**SUBMISSION INSTRUCTIONS:**
If paying by credit card please indicate the credit card information above then:

    **EMAIL** this application to: KUHL@EO.NPA.ORG.
    **FAX** this application to: (801) 379-0331

If paying by check or money order , mail this application with your payment to:

    Network Professional Association, 151 East 1700 South, Provo, UT 84606

# Education and Support Q & A: The Master CNE Certification




**How do I become a Master CNE?**



There are three Master CNE specialization programs: are:

**Master CNE / Network Management**

Requires a CNE--NetWare 3, CNE--NetWare 4, or CNE--UnixWare

The courses you need to take are:
       NetWare 4 Design & Implementation
       Fundamentals of Network Management
       Fundamentals of Internetworking
       Network Management w/ ManageWise
       Two credits of Network Management electives

Network Management CNE elective pool:
       Printing with NetWare
       NetWare Navigator
       NetWare Expert for NMS
       LANalyzer for Windows


**Master CNE / Infrastructure & Advanced Access**

Requires a CNE--NetWare 3, CNE--NetWare 4, or CNE--UnixWare

The courses you need to take are:
       NetWare 4 Design & Implementation
       Fundamentals of Network Management
       Fundamentals of Internetworking
       Internetworking w/ MPR
       Two credits of Infrastructure & Advanced Access electives

Infrastructure and Advanced Access elective pool
       LAN WorkPlace for DOS 4.1
       NetWare TCP/IP Transport
       NetWare NFS
       NetWare NFS Gateway
       NetWare IP

NetWare NFS Services (printing)
NetWare NFS Services (file sharing)
NetWare Connect
NetWare for SAA
NetWare for LAT
NetWare Global MHS


Master CNE / GroupWare Integration

Requires a CNE--GroupWare

The courses you need to take are:
NetWare 4 Design & Implementation
Fundamentals of Network Management
Fundamentals of Internetworking
Four credits of GroupWare Integration electives

GroupWare Integration elective pool:
SoftSolutions 4 Administration
SoftSolutions 4 Advanced Administration
Informs 4 Admininistration & Forms Design
Informs 4 Advanced Administration & Design

## Education and Support Q & A: The CNA Certification

**How do I become a CNA?**

Obtaining the CNA Certification requires passing only one exam. The matching course at a NAEC is also available for all CNE exams. Passing the exam certifies you for the current revision of the product. There are are currently seven different CNA certifications available:

Certified NetWare 4 Administrator
Certified NetWare 3 Administrator
Certified NetWare 2 Administrator
Certified GroupWise 4 Administrator
Certified Informs Administrator
Certified SoftSolutions Administrator
Certified UnixWare Administrator

The latest test objectives can be obtained for any of the certifications by calling (800)233-EDUC [(801-429-5508)].

# Education and Support Q & A: The CNE Certification

**How do I become a CNE?**

As of September 30, 1995, there are four different CNE certifications available: CNE-Netware 3, CNE-NetWare 4, CNE--UnixWare, and CNE--GroupWise. A signed CNE agreement must be on file with Novell prior to beginning the CNE track.

CNE--NetWare 3

| | | |
|---|---|---|
| NetWare 3.1x Admin | 508 | 50-130 |
| NetWare 3.1x Adv. Admin | 518 | 50-131 |
| NetWare 3 Install & Config | 802 | 50-132 |
| NetWare 3 to 4.10 Update | 526 | 50-162 |
| Networking Technologies | 200 | 50-147 |
| Service & Support | 801 | 50-153 |

Two credits from Network Management or InfraStructure and    Advanced Access CNE/Master CNE elective pool

CNE--NetWare 4

| | | |
|---|---|---|
| NetWare 4.1x Admin | 520 | 50-152 |
| NetWare 4.1x Adv. Admin | 525 | 50-161 |
| NetWare 4 Install & Config | 804 | 50-163 |
| NetWare 4.10 Design & Implement | 532 | 50-601 |
| Networking Technologies | 200 | 50-147 |
| Service & Support | 801 | 50-153 |

Two credits from Network Management or InfraStructure and    Advanced Access CNE/Master CNE elective pool

CNE--UnixWare

| | | |
|---|---|---|
| Unix OS Fundamentals | 220 | 50-107 |
| UnixWare Install & Config | 678 | 50-149 |
| UnixWare Admin | 680 | 50-150 |
| UnixWare Adv. Admin | 685 | 50-151 |
| Networking Technologies | 200 | 50-147 |
| Service & Support | 801 | 50-153 |

Two credits from Network Management or InfraStructure and    Advanced Access CNE/Master CNE elective pool

CNE--GroupWare

| | | | |
|---|---|---|---|
| NetWare 4.1x Admin | 520 | 50-152 | |
| GroupWise 4 Admin | 325 | 50-154 | |
| GroupWise 4 Async & Remote | 326 | 50-155 | |
| GroupWise 4 Adv. Admin | 328 | 50-604 | |
| Networking Technologies | 200 | 50-147 | |
| Service & Support | 801 | 50-153 | |

Two credits from GroupWise Integration CNE/Master CNE elective  pool

### Network Management CNE elective pool

| | | | |
|---|---|---|---|
| Printing with NetWare | 535 | 50-137 | 2 |
| NW Navigator | 550 | 50-138 | 2 |
| NW Expert for NMS | 730C | 50-205 | 2 |
| Lanalyzer for Windows | 1125 | 50-105 | 1 |

### Infrastructure and Advanced Access elective pool

| | | | |
|---|---|---|---|
| Lan WorkPlace for DOS 4.1 | 601 | 50-104 | 2 |
| NW TCP/IP Transport | 605 | 50-86 | 2 |
| NW NFS | 610 | 50-87 | 2 |
| NW NFS Gateway | 625 | 50-119 | 1 |
| NW IP | 630 | 50-139 | 1 |
| NW NFS Services (printing) | 640 | 50-160 | 2 |
| NW NFS Services (file sharing) | 645 | 50-160 | 2 |
| NW Connect | 718 | 50-114 | 2 |
| NW for SAA | 720 | 50-148 | 3 |
| NW for LAT | 725 | 50-140 | 2 |
| NW Global MHS | 750 | 50-108 | 2 |

### GroupWare Integration elective pool

| | | | |
|---|---|---|---|
| SoftSolutions 4 Admin | 345 | 50-158 | 3 |
| SoftSolutions 4 Adv. Admin | 348 | 50-159 | 2 |
| Informs 4 Admin & Forms Dsgn | 335 | 50-156 | 3 |
| Informs 4 Adv. Admin & Design | 338 | 50-157 | 2 |

**News**

**CD HELPdesk Series: Novell Products**

Click on any icon for more information

Q+A

## News


### *American Power Conversion*

American Power Conversion announces PowerNet SNMP Agent support to Windows NT and AIX users

APC announces the Control-UPS/400, advanced UPS control, and diagnostics for AS/400 systems

APC unveils new Rack-mounted Smart-UPS line of Uninterruptible Power Supplies featuring SmartSlots


### BindView Development

LAN Support Group Announces a Network Operating System Independent Workstation Auditor

LAN Support Group Announces Technology That Intelligently Manages Workstation Auditing Across LANs and WANs

The LAN Support Group Introduces The BindView Associates Program for Resellers and Consultants

LAN Support Group Ships First True Snap-in Workstation Hardware and Software Inventory Module for Novell's NMS

LAN Support Group Ships Snap-in Workstation Hardware and Software Inventory Module for HP OpenView® for Windows.

The LAN Support Group Ships First Compression NLM for NetWare 3.x

The LAN Support Group, Inc. Announces BindView for NetWare Directory Services


### *Frye Computer Systems*

Frye Launches Windows-Based Client-Server Solution for Inventory Management


### *FTP Software*

FTP Software and Open Market Join Forces to Deliver Premier Internet Business Resources

[FTP Software Announces New Versions of Internet Access and Network Applications Suites](#)

[FTP Software Announces Products and Technology Roadmap for Internet, Enterprise Server, and Agent-based Products](#)

[FTP Software Ships First NFS Client for Windows 95](#)


## Intrack Inc.
[ServerTrak for Windows 2.0](#)

[TrendTrak for Windows](#)


## *Lotus Development*
[Lotus Announces LotusScript 3.0--Showcases Powerful Programmability Enhancements for Notes Release 4.0](#)

[Lotus Delivers NotesView for Managing Today's Notes Enterprises](#)

[Lotus Notes Express Now Offered with Power Macintosh Computers](#)

[Lotus Showcases Next-Generation Messaging Products at EMA Show & Conference](#)

[Plug and Play UPS for Windows 95 integrates power management software for automatic data protection](#)


## *McAfee*
[AST Research to Integrate McAfee Anti-Virus Technology into Bravo and Premmia Business Desktops](#)

[Les Denend Joins McAfee Board of Directors](#)

[McAfee's BrightWorks Data Sheet](#)

[McAfee's LAN Inventory](#)

[McAfee's LAN Support Center](#)

[McAfee's NetRemote](#)

[McAfee's NetTools](#)

[ON Technology's DaVinci eMAIL Moves Ahead With Addition of NDS Integration and Client/Server Technology](#)

[ON Technology Enhances Scheduling Software To Allow Meeting Notices Through E-Mail, Proxies Across Servers](#)

[ON Technology Expands Cross Platform Support With Macintosh Remote Capability for DaVinci eMAIL](#)

[ON Technology Expands Platforms for Notework Electronic Mail, Adding Macintosh and Windows NT Client Support](#)

[ON Technology Introduces Workgroup Collaboration Product For Windows and Macintosh Environments](#)

[ON Technology Releases New Version of SofTrack Metering Software That Capitalizes on Novell's NDS Administration Strength](#)

[ON Technology Ships First NetWare® Auditing Product With Windows Interface](#)

## *Ontrack*

[Ontrack and Y-E Date, Inc. Announce Opening of Data Recovery Facility in Japan](#)

[Ontrack Opens Federal Office in Washington, D.C.](#)

[Ontrack Receives Department of Defense Security Award](#)

[News: Ontrack Recovers Data From Government Magnetic Tape Backups](#)

## **Preferred Systems**

[AuditWare from Preferred Systems](#)

[DS Standard from Preferred Systems](#)

## *Shiva*

[N. Telecom (Nortel) and Shiva Forge Alliance on Internet and Remote Dial-up Switching for ISPs and Large Enterprises](#)

[Shiva Announces Extensive Remote Access Capabilities for Branch Offices, Small and Departmental LANS](#)

[Shiva Announces Major Enhancements to Remote Access Software for](#)

[LANRover and NETModem PLATFORMS](#)

[Shiva Corporation Finalizes the Acquisition of Spider Systems](#)

[Shiva to Acquire Spider Systems, Limited, U.K.-based Provider of ISDN and WAN Technologies](#)

### *Tally Systems*

[Introducing Cenergy: Best of Breed Desktop Asset Management Suite from Tally Systems](#)

[Unisys Selects Tally Systems Products for Desktop Services Program](#)

### *Storage Dimensions*

[Storage Dimensions White Paper: Fault-Tolerant Storage for Non-Stop Networks](#)

### **Winmenu**

[Winmenu Corporate Edition for Novell LANs](#)

## News: DS Standard from Preferred Systems

Powerful Daily NDS Management with a Safety Net
DS Standard NDS Manager is a Windows-based, off-line NDS management tool. Using DS Standard, network managers make changes to a back-end database, not the "live" network.   With its powerful database capabilities, DS Standard reduces the time required to manage NDS, makes migrations as easy as drag-and-drop, and with over 100,000 copies in distribution, DS Standard is the premier NDS management tool available today!

Work Without Affecting Users
Since you are free to make changes without impacting users, DS Standard also reduces the "FUD" and risk factors and minimizes the downtime when migrating to, and managing, NetWare Directory Services.

Expanded NDS Management
Perhaps the greatest advantage your network managers will enjoy is that they can now use powerful database commands to search and administer NDS.   This means completing tasks in a fraction of the time and working during normal business hours!

Also, take advantage of DS Standard's capabilities when:

 Creating Disaster Planning and Recovery Procedures
 Applying Object Standards
 Finding Security Exceptions
 Backing-Up NDS Tree Structures
 Creating NDS Reports
 Making Mass Changes
 Trouble-Shooting NDS
 Documenting and Logging Tree Changes
 Accessing Computer-Aided NDS Expertise
 And More...

Suite Solutions
PSI currently has three products.   Origen and DS Standard NDS Manager provide solutions for change management in NetWare bindery and NetWare Directory Services-based (NDS) environments, respectively.   AuditWare for NetWare Binderies provides security auditing for NetWare 2, NetWare 3, and NetWare 4 bindery-based environments.   AuditWare for NDS will be available in the near future.

# News: AuditWare from Preferred Systems

Automated Reporting Tools for the Enterprise
AuditWare is a Windows-based reporting tool for Novell NetWare.   It is the first available tool that provides true multi-server support.   And since configurations are captured to a database, it alleviates network degradation caused by most other reporting tools.   A Windows-based custom report writer enable exception reporting, and AuditWare's extensible architecture allows external databases to be linked into any report.

Unlike other reporting tools that restrict the user to a C-Worthy interface, AuditWare provides a Microsoft Windows front-end to make it easy to understand and design reports.   These reports must often be presented to a customer, department manager, or MIS VP.   With support for fonts, shading, bordering, and bitmap graphics, AuditWare gives your output a professional look.

PSI has designed AuditWare with the future in mind.   The industry standard architecture, our relationship with Novell, our ongoing work with NetWare Directory Services, and our strategic direction to support multiple operating systems, all make AuditWare a sound platform for the future.   You can have a very robust tool today and not compromise your future plans.

Suite Solutions
PSI currently has three products.   Origen and DS Standard NDS Manager provide solutions for change management in NetWare bindery and NetWare Directory Services-based (NDS) environments, respectively.   AuditWare for NetWare Binderies provides security auditing for NetWare 2, NetWare 3, and NetWare 4 bindery-based environments.   AuditWare for NDS will be available in the near future.

## News: ServerTrak for Windows 2.0

ServerTrak for Windows 2.0 monitors almost 90 NetWare server performance statistics and ratios, making them available for viewing at a Windows workstation anywhere in the network in real-time. ServerTrak for Windows permits viewing of multiple servers simultaneously (number constrained only by the processing power of the viewing workstation). Maintaining short term History (Up to 8 hours) of all monitored activities is selectable on a per server basis and is ideal for analyzing a downed server.

Presentation is in full color graphics (Horizontal and vertical bar charts, scrolling graphs, etc.). Users can print both real-time and History information at any time.

ServerTrak for Windows includes a comprehensive HELP facility, which not only fully explains each monitored statistic and ratio, but relates them to server hardware and NetWare's SET Parameters to optimize server performance.

ServerTrak for Windows also allows users to establish thresholds on each statistic and ratio, which when exceeded, will send an alarm to an MHS interface and/or a designated workstation. ServerTrak for Windows applies to any size NetWare 3/4 environment and operates on one, some, or all, servers in the network.

ServerTrak is a fully integrated product that consists of a data gatherer/alarm log on the server and a data analyzer (Retrieve, process, save, report, print) on the workstation. Performance monitoring, alarms, ease of use, and short term history capabilities makes this an excellent support tool.

## News: TrendTrak for Windows

TrendTrak for Windows monitors and archives almost 90 NetWare server performance statistics and ratios, making them available for baselining and trend analysis. Users can analyze past performance and project future trends for periods up to one year. Network administrators, network support personnel, and independent service providers, at any Windows workstation with access to the server, can retrieve and process data from any TrendTrak server, anywhere in the network, at any time.

Users can preconfigure multiple server environments for unattended, one step processing, saving valuable time. TrendTrak for Windows also allows users to compare statistics from multiple servers at the same time. TrendTrak operates on one, some, or all, servers in any size NetWare 3/4 environment.

TrendTrak's comprehensive HELP facility makes this easy to use product, even easier. The HELP facility not only fully explains each monitored statistic and ratio, but relates them to server hardware and NetWare's SET Parameters to optimize server performance.

TrendTrak is a fully integrated product that consists of a data gatherer (Monitor and archive indefinitely) on the server and a data analyzer (Retrieve, process, report, print/export) on the workstation. The Copy Graph function also allows screen shots to be placed into external documents.

TrendTrak for Windows' ability to forecast network growth, justify network changes, and support network budgeting makes it an excellent planning tool.

TrendTrak for Windows replaces the TrendTrak for DOS product, which earned a

"Best of Times" award in August, 1994.

# News: Winmenu Corporate Edition for Novell LANs



Winmenu Corporate Edition for Novell LANs is a cost effective network menu system that runs under Windows 3.1, Windows NT, WFWG and the new Windows 95!.   The administrators can define menu items from a central place. Users can only see and execute those network applications that were authorized by the administrator(s).   Menu sections can be created and linked to existing *Novell group codes as defined in the network bindery to provide an efective authorization scheme.   A must for any business that wish to use the Windows environment.

The graphical interface was specifically designed to smooth the transition to Windows and provide a consistent way to execute applications.   The end result is a menu that helps users gain confidence in the Windows environment and its fun to use.

Winmenu GE provides the same functionality without utilizing the network bindery. This is specially good for NW4.x, LANtastic and other networks users.

Support is offered via INTERNET and Compuserve electronic mail.   Visit our World Wide Web (WWW) page to obtain the latest version and information about Winmenu products.

WWW Page at:   http://www.halcyon.com/Winmenu/WWW/winmenu.html

## News: Storage Dimensions White Paper

This CD contains a White Paper from Storage Dimensions titled "Fault-Tolerant Storage for Non-Stop Networks. It is stored as a Microsoft Word   for Windows 6.0 document. The file name is SDRAID.DOC in the D:\PROGRAMS\SD directory.To view it, copy it to your hard disk and view it from there. You will need a PostScript-compatible printer to print it.

# News: Ontrack Recovers Data From Government Magnetic Tape Backups

*Has ability to handle sensitive information*

March 20, 1995
Minneapolis, MN--Ontrack Data Recovery today announced that an ever-increasing number of government agencies are choosing professional data recovery services to retrieve inaccessible magnetic tape backup data. With its secure facilities and safeguarding capabilities, Ontrack is able to meet the recovery needs of government organizations, from city and county offices to federal agencies.

Ontrack Facility Security Officer Nancy Riley states, "In the face of government funding and personnel cutbacks, Ontrack Data Recovery can cost-effectively restore magnetic tape data without expensive, time-consuming data reconstruction or re-keying. Ontrack has worked with several government agencies, including the U.S. Navy, FBI, U.S. Congress, and NASA, and is able to address the handling and processing requirements of sensitive information."

Gary Stevens, Ontrack Vice President of Engineering, cites some of the leading causes of tape data loss as tape structure errors, physically damaged tape or tape drive, improper use of backup software, and basic accidents and errors. Stevens says, "More than 50% of magnetic tape data losses could be avoided if users simply tested their backups on a regular basis. This includes verifying after each backup and periodically recovering and testing data integrity. While it may seem like a time-consuming procedure, testing will save users both time and money in the long run, as they protect their valuable data."

Ontrack Data Recovery specializes in recapturing data from any hard drive, tape backup, network, floppy diskette, magneto-optical device, or alternative media suffering from electro-mechanical failure and/or data corruption. Ontrack has expertise in NetWare, DOS, OS/2, Macintosh, Unix, Xenix, Sun, DEC, Wang, Banyan Vines, 10Net, IBM 3600, VMS, and more. Emergency services, including on-site, weekend, 24-hour, and priority support are available.

Ontrack's headquarters are located at 6321 Bury Drive, Minneapolis, MN 55346 800-752-1333 (612-937-1107). A sales office and data recovery lab are also located in California 800-752-7557 (714-263-9245). European headquarters are located in the United Kingdom 0800 24 39 96
(+44 (0) 181 974 5522). Customers in Germany may call toll-free 0130 815 198. Customers in France may call toll-free 05 90 72 42. Ontrack Data Recovery Japan will open April 3, 1995. They may be reached at (0429) 32-6365.

## News: Ontrack and Y-E Date, Inc. Announce Opening of Data Recovery Facility in Japan



*Joint venture brings first data recovery services to Japan*

March 10, 1995
Minneapolis, MN--Ontrack Data Recovery announced today that it has entered into an agreement with Y-E Data, Inc. of Japan, a subsidiary of Yaskawa Electric Corporation. On April 3, 1995, they will together open Ontrack Data Recovery Japan, which Y-E Data will implement and manage. Located near Tokyo, the facilities will include both a sales office and data recovery lab.

Ontrack CEO Michael Rogers says of the agreement, "We are excited at the opportunity to establish Japan's first data recovery facility. We believe that there is no one better than Y-E Data with whom to undertake this venture. With their vast experience and knowledge of the Japanese computer and peripheral markets, they are ideally positioned to meet the data recovery needs of computer users in their country."

Y-E Data Ontrack Division General Manager, Hiro Tanaka, adds, "We, too, are looking forward to beginning this new relationship and new business. Data Recovery services are a unique concept in Japan, and we are the only "high-tech hospital" of this kind in our country for patients suffering from data loss. We are sure that the availability of these services will help Japanese computer users recover from data emergency situations."

Ontrack Data Recovery specializes in recapturing data from any hard drive, tape backup, network, floppy diskette, or alternative media suffering from electro-mechanical failure or data corruption. Ontrack's list of recoverable platforms includes DOS, NetWare, Macintosh, OS/2, DEC, Sun, Unix, Xenix, Wang, and Banyan Vines, including the Japanese versions. Additionally, Ontrack Data Recovery services are fully approved by Conner, Digital Equipment, Iomega, Maxtor, Micropolis, Quantum, Seagate, Western Digital, and other data storage manufacturers.

 Ontrack's North American headquarters is located at 6321 Bury Drive, Minneapolis, MN 55346 1-800-752-1333 (612-937-1107). A sales office and data recovery lab are also located in California at 2400 Main Street, Ste. 200, Irvine, CA 92714 1-800-752-7557 (714-263-9245). European headquarters are located at Surrey House, 34 Eden Street, Kingston-upon-Thames, Surrey KT1 1ER, U.K. 0800 24 39 96 (+44 (0) 181 974 5522). Customers in Germany may call toll-free 0130 815 198. Customers in France may call toll-free 05 90 72 42.

Y-E Data, Inc., a subsidiary of Yaskawa Electric Corporation, is a leader in floppy disk drive technology. Y-E Data also manufactures and sells printers and sub-notebook computers.

Y-E Data's operation is international, with offices in Japan, China, Thailand, Germany, and the United States. Ontrack Data Recovery Japan facilities will be located within Y-E Data's headquarters at 182 Shinkoh, Iruma, Saitama, 358 Japan (0429) 32-6365; toll-free within Japan 0120-413-374; Fax (0429) 32-6370.

## News: AST Research to Integrate McAfee Anti-virus Technology Into Bravo and Premmia Business Desktops



*ROMShield Provides Desktop Users First Line of Defense Against Computer Viruses*

SANTA CLARA, Calif. (May 15, 1995)--McAfee (NASDAQ: MCAF) announced today that AST Research Inc. (NASDAQ: ASTA), the world's sixth largest PC manufacturer, has licensed key anti-virus technology from McAfee. Effective immediately, AST will begin shipping Bravo and Premmia 100 Mhz Pentium desktop systems protected by McAfee's ROMShield anti-virus firmware.

McAfee's technology plays a leading role in the AST-CommandCenter utility package, also announced today by AST, which provides AST desktop users advanced security and system management capabilities. Under the terms of the licensing agreement with AST, McAfee has provided customized versions of its ROMShield anti-virus firmware, which prevents against boot virus infections.

"AST is pleased to arm our business desktop users with McAfee's industry-leading virus protection as part of AST-CommandCenter," said Scott Smith, AST's vice president and general manager, desktops. "Our relationship with McAfee is part of our overall strategy to lower the cost of PC ownership for our corporate customers and end-users."

"We applaud AST for taking proactive and decisive steps to protect their customers from viruses," said Rick Kreysar, vice president of marketing at McAfee, based in Santa Clara, Calif. "By utilizing McAfee's industry-leading anti-virus firmware and software technology, AST-CommandCenter provides users with a solid first line of defense against computer viruses."

ROMShield Prevents Boot Virus Infections
According to National Computer Security Association estimates, boot viruses account for only about 10% of all known viruses, yet are responsible for 86% of actual virus infections. Well-known boot viruses include Monkey, Form, Michelangelo, and Stoned. The most common cause of boot virus infection is when users accidentally boot their computer from an infected floppy disk. AST addresses the boot virus threat by incorporating McAfee's ROMShield firmware into upgradeable FlashROM chips on Bravo and Premmia motherboards.

The reason boot viruses are so prolific is that boot viruses infect during the boot process and before the operating system and anti-virus defenses have been loaded. No anti-virus software package on the market today is capable of

preventing boot virus infections during the boot process.

ROMShield prevents boot virus infection by installing itself as extended BIOS before the system accesses the boot and master boot record (MBR) of the system disk, which is where boot viruses lurk. With ROMShield activated in memory, the system can detect the presence of boot viruses hiding within the MBR and boot sector. Once a virus is detected, ROMShield suspends the boot process and allows the administrator to take action.

AST is the first PC vendor to ship ROMShield-enabled systems. Although this represents McAfee's first desktop systems deal, ROMShield has already established itself as the leading anti-virus firmware solution for Ethernet network adapters. ROMShield is now readily available from leading Ethernet NIC card vendors such as 3Com, Microdyne/Eagle, and SMC. These vendors collectively hold over 50% of the network adapter market.

In addition to shipping pre-configured with ROMShield, the AST systems also ship pre-loaded with VShield, McAfee's TSR technology than scans for over 5,000 known and unknown viruses. While ROMShield with VShield provides a formidable deterrent against computer viruses, they are not intended as a replacement for traditional anti-virus scanning, cleaning, and removal software.

Founded in 1989, McAfee is a leading vendor of Network Security & Management products for the PC LAN market. Its product line is comprised of award-winning client/server applications including anti-virus, asset management, metering, electronic software distribution, Windows Desktop Management, print management, help desk and remote control software products. The company's products are distributed electronically through its own World Wide Web server (www.mcafee.com), Internet (mcafee.com), its HomeBase on-line service (408-988-4004), CompuServe (GO MCAFEE), America Online (MCAFEE), through computer resellers, and through a unique worldwide network of 152 authorized agents in 60 countries who provide local sales and technical support. The company is headquartered in Santa Clara and maintains a sales and product development office in Tinton Falls, New Jersey. McAfee's general sales number is (408) 988-3832.

# News: McAfee's BrightWorks Data Sheet

INTEGRATED NETWORK SOFTWARE MANAGEMENT
   Centralized console for network management
   An integrated package suite of tools
   Software license metering
   Simplifies software distribution
   Complete hardware-software inventory
   Comprehensive, flexible reports
   Help desk
   Server monitoring

BrightWorks gives you the one thing you've always wanted in a NetWare network management tool: Everything. Metering. Inventory. LAN software distribution. Comprehensive reporting. Help desk. Even server monitoring. All "best-of-breed" technology. All together in an integrated suite of Windows-based tools.

BrightWorks mobilizes the full breadth and depth of innovation offered by McAfee. And that means you'll have a network that's easier to manage and control; a network that can save you time and money. Ultimately, the BrightWorks console puts everything at your command. And that's the one thing you need to run a tight network.

Integrated Console For Network Management
McAfee products are designed with you in mind. BrightWorks has an administrative console considered to be the most flexible, comprehensive network management utility. An award-winning enterprise can now be right at your fingertips.

- Central control for security management including diagnostics, support and anti-virus

- Multi-platform integration

- Smart launch diagnostics, support and anti-virus functions for each user

- Enables integration of additional functionality through non-McAfee products

An Integrated Suite Of Tools

This powerful product incorporates the metering and monitoring functionality of McAfee's SiteMeter, along with advanced asset management capabilities of McAfee's LAN Inventory.

The Leader in Enterprise Software Metering

- Industry-standard NLM metering, without TSRs

- Secure software license enforcement

- Helps you eliminate excess licenses

- Full Support of Compaq Intelligent Manageability

Reduces the 30-minute inventory-per-PC to just seconds

- Automatically builds and updates a database of PC, Mac and file server hardware and software

- Auto-learn function ensures complete coverage of new and in-house applications

- Alerting based on changes to network hardware and/or software

- No workstation TSR required

Simplifies LAN Software Distribution

- Includes a feature to remotely upgrade and install software through automated distribution; from applications and drivers, to system files and data files.

- Automatic and remote installation of software on the network

- Install driver and application upgrades on every node

- Offers a choice of scripting languages

Comprehensive, Flexible Reports

- Supplies you with detailed software information across the network, creating the tools you can use to justify decisions, plan for future growth and track the

ever-changing LAN environment.

- Quickly builds custom reports

- Powerful querying engine tracks critical system information

- Open database ensures multiple export formats for data

## Help Desk

- Centralize Help Desk operations

- Rapidly diagnoses and solves support problems

- User-definable fields

## Server Monitoring

- Monitors over 110 NetWare internals for proper settings

- Unlimited number of file servers concurrently monitored

- SmartTune feature responds dynamically to fluctuating network activity and can react to heavy loads with appropriate tuning activity

- Graphically displays file servers' statistical data in real time

Expect More Innovation From McAfee

McAfee offers an integrated suite of desktop and administration utilities designed to help you operate your PC LANs more efficiently and economically. And our "best-of-breed" technology is backed by award-winning support. Whether it's our leading anti-virus products, or tools for advanced network security and management, you can expect more innovation from McAfee.

System Requirements:
 Network requirements
 Operating System: Novell NetWare 3X, 4X
 Disk space: 18.5 MB required, 25 MB recommended
 Database: BTRIEVE NLM/BREQUEST.EXE 6.1 or greater

<u>Administrative Console</u>
  DOS 5.0 or later
  Microsoft Windows 3.1 in enhanced mode
   386SX or higher


<u>McAfee</u>
2710 Walsh Avenue, Santa Clara, CA 95051
Telephone: 408-988-3832
Fax: 408-970-9727

<u>Download McAfee</u>
BBS: 408-988-4004
Internet FTP: ftp.mcafee.com
WWW: http://www.mcafee.com
CompuServe: GO MCAFEE
America Online: MCAFEE
The Microsoft Network: GO MCAFEE

McAfee, BrightWorks, SiteMeter, NetTune and LAN Inventory are trademarks of
McAfee, Inc. Other brands and products may be trademarks of their respective
holders. © 1995 McAfee, Inc. All rights reserved.

# News: McAfee Debuts BrightWorks™ 2.0



*Network Management Suite Gains New Server Monitoring, Performance Tuning, Help Desk, Scripting, and Enterprise Metering Capabilities*

*McAfee Unveils Strategy to Create Industry's First True Integrated Enterprise Network Management Suite*

NETWORLD+INTEROP, LAS VEGAS, NV (March 28, 1995)--McAfee (NASDAQ: MCAF) today released BrightWorks 2.0, an integrated enterprise network management suite for NetWare 3.x and 4.x networks. The suite gains new server monitoring, server performance tuning, help desk, and advanced scripting modules. The product's enterprise metering, inventory, and software distribution capabilities have also been enhanced.

Combined with add-on support for remote control and anti-virus modules, BrightWorks 2.0 provides network administrators the broadest integrated enterprise-wide Network Management solution for PC networks. The BrightWorks suite, which includes two years of free updates and support, is priced at one half the cost of competing suite solutions from vendors such as Intel and Symantec.

"BrightWorks 2.0 has entered the next stage of its evolution, and is now ideally positioned to meet the dynamic needs of small businesses, government agencies, and large multi-national corporations," said Rick Kreysar, McAfee vice president of marketing. "With its broad range of scaleable modules, BrightWorks 2.0 is the only integrated network management suite capable of meeting the network management requirements of both small LANs and enterprise WANs."

The next stage in the evolution of BrightWorks will arrive by late summer when McAfee introduces BrightWorks 3.0. BrightWorks 3.0 will provide the following four critical requirements for enterprise PC management: Complete multi-server support; full WAN-enabled TCP/IP protocol support; a centralized SQL data repository; and full SNMP-enabled Unix integration with HP Openview, IBM NetView, and Sunsoft's SunNet Manager.

## *New!*     NetTune™ Server Monitoring and Performance Tuning

The new NetTune module, which incorporates technology licensed from HawkNet, Inc., allows administrators to monitor server attributes and tune server performance. NetTune maps memory, creates graphical reports for over 100 set parameters, and monitors server configuration. The software monitors activity in seven key areas including LAN parameters, connections, SET parameters,

volumes, and NLMs.

NetTune can also increase server performance by up to 25%. To accomplish this feat, NetTune monitors server utilization patterns and makes automatic, real-time adjustments to over 60 set parameters. Server utilization pattern information is consolidated into a historical database of fileserver activity so that BrightWorks can automatically predict, diagnose, and respond to network and fileserver activity.

The NetTune module also allows administrators to configure BrightWorks to perform application-specific tuning. For example, to speed network backups and increase network availability, BrightWorks can automatically change tuning parameters when backup applications are run and then reset parameters when backups are finished. Administrators can also manually adjust set parameters from the BrightWorks console.


## *New!*     Built-in Help Desk With LAN Support Center™

According to analyst estimates, a large portion of the cost to manage network assets relates to user support. To address this critical support requirement, McAfee has integrated their popular help desk, LAN Support Center, into the BrightWorks 2.0 management console.

"The world of network management technology continues to consolidate functionality at a rapid pace," said Bob Johnson, director and principal analyst for software services at Dataquest in Framingham, MA. "Customers win as they gain new feature combinations they use everyday across software/hardware asset management, help desk tools and systems management capabilities."

LSC helps administrators automate the collection, tracking and analysis of end-user support requests. LSC's flexible database allows administrators to custom-tailor screen layout for simplified data tracking. The database also makes it simple for administrators to quickly access past solutions to common problems. Powerful reporting capabilities allow administrators to track help desk effectiveness and ensure that user support requirements are being met.

LSC and LAN Inventory share a common inventory database, allowing administrators to access inventory information from within LSC. LSC also supports full client/server integration with HelpPlus, McAfee's client-side trouble ticket generator. HelpPlus users can automatically transfer trouble-tickets into the LSC database for faster troubleshooting.


## *New!*     Powerful Scripting with PowerScript™ Enhances ESD

PowerScript, a new high-end Visual Basic-like scripting language with full network extensions, offers administrators centralized control over a wide range of network operating parameters and increased software distribution flexibility.

PowerScript frees administrators from having to perform repetitive tasks. Using the Powerscript macro recorder, for example, administrators can perform a task once, automatically capture the task steps in a self-generating script, and then play out the script across the enterprise. The administrator can also perform routine file maintenance tasks using Powerscript scripts that are automatically activated at startup, as scheduled events, or from icons.

While PowerScript is a powerful administrator's tool, it also insulates users from the complexities of today's enterprise-wide network. For example, when a user selects a program item from their desktop menu, a Powerscript script can transparently attach the user to file servers, map drives, change paths on-the-fly, and check network membership and log-in rights.

PowerScript complements BrightWorks' present QuickScript™ scripting capability. QuickScript is designed for users who want to quickly produce sophisticated and flexible scripts without programming.


*Improved!*       Enterprise-wide Software Metering and Monitoring

BrightWorks now integrates McAfee's SiteMeter™ 5.0 metering software. SiteMeter 5.0, which was recently named Product of the Year by LAN Magazine, is the industry's first enterprise software metering and monitoring package to support TCP/IP.

By allowing organizations to share or "float" software licenses across local and wide area links, BrightWorks customers can transcend traditional geographic software licensing boundaries and limitations. Using the data and reports provided, network administrators can base purchase decisions on actual concurrent usage as opposed to the number of seats. One early SiteMeter customer, Household Credit Services, of Salinas, CA, estimates SiteMeter will help it reduce its enterprise-wide Microsoft Office license expense by $800,000 in the next two years alone.

The SiteMeter 5.0 module consolidates multi-server metering and reporting under a centralized administration console, allowing administrators to easily view and manage global application usage. Its flexible reporting capabilities generate a variety of easily produced SPA-approved reports to demonstrate license compliance in the event of an audit. An agentless metering feature allows BrightWorks to meter applications across the enterprise without requiring a TSR.

*Improved!*        Software Inventory Improved

The BrightWorks LAN Inventory™ module, which automates the collection, consolidation, analysis, and reporting of LAN asset information, has been upgraded to version 3.2. Announced March 8, the module provides full support for Compaq's Intelligent Manageability strategy, as well as several new capabilities designed to help network administrators track and manage distributed PC assets.

The LAN Inventory 3.2 module incorporates new technology designed to improve the product's already strong recognition rates for software packages installed on the desktop and server. Other LAN Inventory 3.2 enhancements include consolidated reporting options, an enhanced user interface, flexible scheduling of audit times, 25% faster audits, improved security during audits, and the ability to recognize flawed Intel Pentium chips. LAN Inventory integrates with McAfee's software distribution module, allowing administrators to perform distribution tasks based on inventory data.

*Improved!*        Reporting

McAfee has enhanced the reporting module of BrightWorks 2.0. The module now features an enhanced visual interface for designing reports while viewing live data, allowing for faster, more interactive report design. The reporting module also provides extended and simplified database access. Cryptic database file names have been replaced with intuitive field names and formulas.

Pricing, Support, and Availability

McAfee backs its products with the industry's most comprehensive upgrade and support policies. Under McAfee's unique software licensing model, BrightWorks customers receive two years of free upgrades and unlimited live telephone support. This level of comprehensive product maintenance and support costs 50% less than suite solutions from competing vendors such as Intel and Symantec, who charge extra for product upgrades and support.

Two year subscription fee pricing for BrightWorks 2.0 ranges from $42.00 per node for 50 nodes to $25.50 per node for 1000 licenses. Existing BrightWorks 2.0 customers can upgrade to version 3.0 at no additional cost.

BrightWorks 2.0 begins shipping through electronic channels this week. The product will be available through retail channels on April 3. Electronically distributed versions are identical to shrink wrap versions, and contain no time-bombs or encryption.

Founded in 1989, McAfee is a leading vendor of Network Security & Management products for the PC LAN market. Its product line is comprised of award-winning client/server applications including anti-virus, asset management, metering, electronic software distribution, Windows Desktop Management, print management, help desk and remote control software products. The company's products are distributed electronically through its own World Wide Web server (www.mcafee.com), Internet (mcafee.com), its HomeBase on-line service (408-988-4004), CompuServe (GO MCAFEE), America Online (MCAFEE), through computer resellers, and through a unique worldwide network of 152 authorized agents in 60 countries who provide local sales and technical support. The company is headquartered in Santa Clara and maintains sales and product development offices in Tinton Falls, New Jersey.

McAfee (NASDAQ: MCAF) is a leading international supplier of enterprise-wide Network Security and Management software. Since its founding in 1989, the Company has registered over 26 quarters of consecutive revenue growth. Key to McAfee's consistent growth is the Company's relentless dedication to total customer satisfaction. The company achieves this total customer satisfaction by providing the best-of-breed product quality, exceptional customer service and support, and innovative channels of distribution. According to Information Week, McAfee is one of the "Top 10 Up-And-Coming Software Vendors."

Headquarters
2710 Walsh Avenue
Santa Clara, CA 95051
Tel (408) 988-3832
Fax (408) 970-9727

Business Facts
143 employees
1994 bookings of $43,217,000

Customer Facts

- 80% of the Fortune 100 use McAfee software

- 25% of the Fortune 100 hold enterprise-wide site licenses

- According to IDC, McAfee's VirusScan holds 76% marketshare in the DOS, Windows, and OS/2 anti-virus market

- Over one million network nodes are managed by McAfee's Network

Management Software

## Pricing Model

McAfee utilizes a unique two year software subscription licensing policy. During the licensed period, customers are entitled to unlimited live telephone support and unlimited product updates.

## Electronic Distribution

McAfee is a recognized pioneer in electronic software distribution. All McAfee products, upgrades and documentation are distributed in their full functional form, without time bombs and without encryption, via Internet FTP (ftp.mcafee.com), World Wide Web (http://www.mcafee.com), McAfee's HomeBase™ BBS (408-988-4004), and online services such as CompuServe (GO MCAFEE) America Online (MCAFEE), and The Microsoft Network (GO MCAFEE).

## Distribution Channels

McAfee complements its electronic software distribution strategy with traditional distribution channels, including:

- Authorized agents in 60 countries

- Distributors (Ingram Micro, Tech Data, Merisel)

- Corporate resellers (Corporate Software, Software Spectrum, Stream, ASAP, Soft Choice)

- Traditional retailer (Best Buy, CompUSA, Egghead, Fry's, Computer City, Micro Center, Electronic Boutique)

## Customer Support

McAfee is famous for its dedication to customer satisfaction. McAfee's customer support, technical support, and product development departments provide live technical support and problem resolution. A sophisticated online bug tracking system immediately informs product development of customer reported bugs and informs customers as soon as fixes are developed.

## Strategic Relationships

Compaq
Hewlett Packard
Novell
Desktop Management Task Force
Microsoft
AST
National Computer Security Association (NCSA)
Network Professional Association (NPA)

## Customers

Abbott Laboratories, Southern Company, Chase Manhattan Bank, Smith Barney, Ford Motor Company, Texaco, Mobil Oil, Turner Broadcasting, Monsanto, Social Security Administration, Motorola, and Weyerhaeuser

## Management

Bill Larson, President and CEO
Terry Duryea, Chief Financial Officer
Bob Chappelear, Vice President, Engineering
Dennis Cline, Vice President, North American Sales
Richard Kreysar, Vice President, Marketing
Peter Watkins, Vice President, International
Jim Lynch, Vice President, International

## Investor Relations

Clairene Ruzzo, McAfee (408) 988-3832

## Media Relations

Mark Coker, Dovetail Public Relations (408) 395-3600

# News: McAfee NetShield 2.2 and VirusScan 2.2 Anti-Virus Solutions



*Achieve Over 97% Detection Rate; New Functionality Extends Enterprise Protection*

SANTA CLARA, Calif. (May 1, 1995)--McAfee (NASDAQ: MCAF) today introduced NetShield 2.2 for NetWare and VirusScan 2.2 for DOS, Windows and OS/2. The new releases provide faster scanning performance, improved ease-of-use, stronger manageability, and maximum virus detection. New features include better integration between the applications, Novell NetWare 4.1 support, enhanced notification options, a new Windows console, administrator access controls, and increased scanning and detection performance.

"The three overriding customer virus concerns are detection, removal and support," said Scott Gordon, McAfee's Anti-Virus Product Manager. "According to IDC, VirusScan holds a 67% marketshare for desktop anti-virus software. As the best-selling vendor, our large worldwide installed base enables us to discover and eradicate new virus threats before they become widespread. Combined with our pioneering expertise in virus research, McAfee customers can be assured of a swift and decisive response to their virus infections. In order to provide our customers the finest virus protection and enterprise manageability, we plan to extend the platform support of our award-winning solutions to include Windows NT and Windows 95."

## Improved Enterprise Manageability and Control

McAfee makes it easier for administrators to manage and maintain current anti-virus protection across the enterprise. NetShield 2.2 and VirusScan 2.2 now share a common virus scanning engine and library, enabling network managers to employ only one set of monthly updated files. A new NetShield Windows console delivers point and click convenience to streamline administrator tasks. Utilizing Novell's NetWare Directory Services (NDS) in NetWare 4.1, network administrators can easily view and configure multiple NetShield servers. NetShield's cross-server updating feature also takes advantage of NDS to automatically synchronize virus signature updates.

NetShield has expanded its virus alerting options to provide users immediate notification of new and suspected network virus infections. The notification options, which include pager, console, network broadcast, and Global Message Handling Services (GMHS), allow administrators to quickly respond to virus threats. The support for GMHS enables NetShield to broadcast alerts through popular e-mail programs such as Lotus Development's cc:Mail.

NetShield features a new management module that allows network administrators to create hierarchical password and access privilege rights for individual LAN administrators within enterprise environments. This module was created in response to demands by McAfee customers within distributed, multi-server networks who required more in-depth administrator access controls. The unique feature further enhances NetShield's safeguards and better enforces corporate security.

## Scanning Performance and Virus Detection Improved

The new VirusScan engine allows NetShield to perform scans up to 500% faster than previously possible. This makes daily virus prevention tasks less intrusive on server resources and end users, and was accomplished by incorporating new technology that executes more efficient scans while reducing server CPU utilization. The new scanning algorithms also ensure highly accurate virus identification. NetShield and VirusScan use a combination of byte string scanning, wildcard scanning, emulation, heuristic analysis, filtering and checksumming techniques.

Static anti-virus products are inadequate against the more than one hundred new viruses introduced each month. McAfee engineers and virus researchers bolster the detection capabilities of NetShield and VirusScan monthly, providing McAfee customers the electronic equivalent of an immune system booster shot for their enterprise network defenses.

In March, Patricia Hoffman's Virus Information Summary Listing (VSUM1) reported that both best-selling McAfee products scored virus detection rates exceeding 97%, higher than any other products in their class. Presently, McAfee identifies over 5,000 known and unknown viruses, including: Boot sector; file; encrypted; polymorphic; mutation engine; stealth; multi-partite; and parasitic viruses. Monthly updates, unlimited live telephone support, and emergency virus response services are provided free to McAfee subscribers for two years.

## Integrates with BrightWorks Network Management Suite

NetShield 2.2 now integrates directly into the administration console of McAfee's award-winning BrightWorks 2.0 network management suite for NetWare LANs. BrightWorks, which features help desk, asset management, license metering, software distribution and network monitoring modules, provides network administrators a completely integrated network management environment.

## VirusScan for Windows 95 In Development

McAfee builds client-driven products and strives to provide the most advanced virus detection and removal technology to a broad range of PC-based platforms. Throughout the year, McAfee will introduce new anti-virus products and updates, as well as further integration between NetShield and VirusScan. In the third quarter, McAfee will introduce VirusScan for Windows 95. VirusScan for Windows 95 is a native application that will integrate and take advantage of the Windows 95 operating system. Current McAfee VirusScan subscribers who intend to migrate to Windows 95 will receive a pro-rated credit of up to 80% of their purchase price for the new product.

Pricing, Support, and Availability

McAfee backs its products with the industry's most comprehensive upgrade and support policies. Under McAfee's unique software licensing model, customers receive two years of free upgrades and unlimited live telephone support. This level of comprehensive product maintenance and support costs 50% less than anti-virus solutions from competing vendors, who often charge extra for product upgrades and support.

NetShield is priced based on the number of network nodes. Two year subscription fee pricing for NetShield 2.2 ranges from $18.00 per node for a 25 node network to $6.12 per node for 2,500 nodes. VirusScan pricing ranges from $65 for a single user to $12.40 per node for 2,500 users. Current NetShield and VirusScan subscribers can update to the new versions at no cost.

VirusScan 2.2 is now shipping through retail and electronic channels. NetShield 2.2 will begin shipping on June 1. Electronically distributed versions are identical to shrink wrap versions, and contain no time-bombs or encryption.

Founded in 1989, McAfee is a leading vendor of Network Security & Management products for the PC LAN market. Its product line is comprised of award-winning client/server applications including anti-virus, asset management, metering, electronic software distribution, Windows Desktop Management, print management, help desk and remote control software products. The company's products are distributed electronically through its own World Wide Web server (www.mcafee.com), Internet (mcafee.com), its HomeBase on-line service (408-988-4004), CompuServe (GO MCAFEE), America Online (MCAFEE), through computer resellers, and through a unique worldwide network of 152 authorized agents in 60 countries who provide local sales and technical support. The company is headquartered in Santa Clara and maintains a sales and product development office in Tinton Falls, New Jersey.

1 Patricia Hoffman's VSUM service is widely recognized for the rigorous and independent testing it performs on third party anti-virus applications each month.

The results of these tests are published electronically in the VSUM report, which also contains a hypertext database of all known viruses. The report is distributed as shareware and can be downloaded at (408) 244-0813.

# News: McAfee's LAN Inventory

<u>Easily Tracks LAN Hardware and Software Assets</u>

- Reduces the cost of network ownership

- The most extensive LAN inventory ever!

- Collect all your critical asset information

- Comprehensive, flexible reports

Full support of Compaq's intelligent manageability enabled products

A manual audit of hardware and software takes only about 30 minutes per machine; no biggie. Unless you've got hundreds of workstations, on and off-site . Or you continue to upgrade equipment. Or you move. Lets face it, it's time to drop that clipboard and screwdriver and pick up LAN Inventory.

Now you're in control. That 30-minute machine inventory can now be completed in seconds. Purchasing and warranty information is managed perfectly. LAN Inventory even offers comprehensive software application coverage for new and in-house applications. So take stock of your current inventory techniques. If you think there's room for improvement, call McAfee and license LAN Inventory.

<u>Reduces The Cost Of LAN Ownership</u>

LAN Inventory is the most advanced, native Windows network inventory tool available today. But then, that's what network managers have come to expect from McAfee. You'll be more proactive with your decisions, while eliminating additional support calls.

<u>Integrated console for network management</u>

Central control for security management including diagnostics, support and anti-virus

Multi-platform integration

<u>The Most Extensive LAN Inventory Ever!</u>

McAfee is known for frequent updates and enhancements to its products.

Our commitment to innovation frees-up valuable time for you to accomplish the critical tasks of LAN administration.

Reduces the 30-minute inventory to just seconds

Identifies over 2,000 applications

Automatically builds and updates a database of hardware and software for file servers, networked and stand alone PCs and Macs

Eliminates "sneaker-net"

Auto-learn function ensures complete software application coverage for both new and in-house applications

Alerting based on changes to network hardware and/or software

Extensive platform coverage - DOS, Windows and Mac

No workstation agent required; memory is unaffected

Concise viewing and fast generation of data through the Software

Package Identifier and Hide Files functions


<u>Comprehensive, Flexible Reports</u>

Supplies you with detailed software information across the network, creating the tools you can use to justify decisions, plan for future growth and track the ever-changing network environment.

Quickly builds custom reports

Powerful querying engine tracks critical system information

Open database ensures multiple export formats for data. .


<u>Collects All Your Critical Asset Information</u>

Network Information

User name
Network address
NetWare shell version
Physical connection
Network card type and configuration
IPX/SPX versions

File Server Information
Network OS version
Network adapter board, address and name
File server memory
Volume information
File server processor
Physical drivers
Physical disk names
Software applications including the path, file name and size

Software Information
File name and size
Path
Detects and stores contents of AUTOEXEC.BAT, CONFIG.SYS and any other files of your choosing

PC Information
Processor type brand
Numeric coprocessor
Bus type
BIOS information
DOS type/version
CMOS status
Fixed and floppy drives
Video adapter
Video monitor type
Base memory
Extended memory
Expanded memory
EMS drive version
Keyboard type
Parallel and serial ports
Game ports

Macintosh Information
Model/processor
Mounted volume
Floating point processor
System RAM

ROM size and version
Keyboard type
Monitor type
Hard and floppy drives
Slot adapters and drivers
SCSI devices
AppleTalk version
Finder version
AppleShare version
Software applications including file name, path and file size

## Expect More Innovation From McAfee

McAfee offers an integrated suite of desktop and administration utilities designed to help you operate your PC LANs more efficiently and economically. And our "best-of-breed" technology is backed by award-winning support. Whether it's our leading anti-virus products, or tools for advanced network security and management, you can expect more innovation from McAfee.

## System Requirements:

Network requirements
    Operating System: Novell NetWare 3X, 4X
    Disk space: 13 MB required, 25 MB recommended
    Database: BTRIEVE NLM/BREQUEST.EXE 6.1 or greater

Administrative Console
    DOS 5.0 or later
    Microsoft Windows 3.1 in enhanced mode
    386SX or higher
    4 MB RAM

## McAfee
2710 Walsh Avenue, Santa Clara, CA 95051
Telephone: 408-988-3832
Fax: 408-970-9727

## Download McAfee
BBS: 408-988-4004
Internet FTP: ftp.mcafee.com
WWW: http://www.mcafee.com
CompuServe: GO MCAFEE

America Online: MCAFEE
The Microsoft Network: GO MCAFEE

McAfee and LAN Inventory are trademarks of McAfee, Inc. Other brands and products may be trademarks of their respective holders. © 1995 McAfee, Inc. All rights reserved.

# News: McAfee Introduces LAN Inventory 3.2

*Provides Full Support for Compaq's Intelligent Manageability Strategy and New Features for Simplified LAN Asset Management*

*LAN Inventory Helps Slash the Cost of LAN Ownership*

SANTA CLARA, Calif. (March 8, 1995)--McAfee (NASDAQ: MCAF) today debuted LAN Inventory 3.2, a new version of its industry-leading asset management package for NetWare 3.x and 4.x LANs. The package combines comprehensive support for Compaq's Intelligent Manageability Strategy with several new capabilities designed to help network administrators track and manage distributed PC assets.

According to Gartner Group, the cost to purchase an average desktop PC is $4,000, yet the cost to operate and manage that PC over five years increases ten-fold to $40,000. LAN Inventory 3.2 addresses these cost-of-ownership concerns by providing network administrators tools to automate the collection, consolidation, analysis, and reporting of LAN asset information.

LAN Inventory 3.2's support for Compaq's Intelligent Manageability Strategy simplifies the administration of Compaq's new line of Deskpro PCs. Utilizing LAN Inventory's improved Window 95-like interface, administrators can track key characteristics of the Deskpro line, including asset tag information, ROM revision date, system board revision level, model name, system chassis serial number, hard drive make and model, and PC monitor attributes such as model, manufacture date, and serial number.

"We're pleased that Compaq is working with McAfee to ensure the manageability of their PCs," said Bill Larson, president and CEO of McAfee. "Compaq's Intelligent Manageability Strategy will be well-received by network administrators who are struggling to manage their desktop hardware and software assets. We hope other desktop systems manufacturers will follow Compaq's precedent-setting lead in recognizing the importance of desktop management."

"We're pleased to have McAfee as a valued member of our Desktop Management Solutions Partners program," said Kevin Bohren, vice president, desktop marketing, Desktop Product Division, Compaq Computer Corporation. "Together, Compaq and McAfee are working to provide products that significantly lower the cost of ownership of networked PCs. We value McAfee's expertise in asset management and look forward to working with them in the future to bring additional exciting Intelligent Manageability features to the desktop."

In addition to supporting Compaq's Intelligent Manageability Strategy, LAN Inventory 3.2 provides new technology designed to improve the product's already strong recognition rates for software packages installed on the desktop and server. McAfee plans to offer free electronic updates of the LAN Inventory detection database on a quarterly basis (see final paragraph of release for download sites and addresses).

Other new LAN Inventory 3.2 enhancements include consolidated reporting options, flexible scheduling of audit times, 25% greater performance, and the ability to recognize flawed Intel Pentium chips.

LAN Inventory automatically builds and updates a database of over 60 different network, fileserver, and desktop attributes. Comprehensive reporting options allow administrators to analyze large quantities of data and maintain an up-to-date status of LAN assets and asset changes. This information can be used for network planning, resource allocation, and growth projections.


Asset Management Components

Inventory software is just one component in a network administrator's asset management toolbox. Other asset management tools now reaching widespread deployment include Metering software, which monitors software usage and license compliance, and Electronic Software Distribution (ESD) software, which automates distribution of software updates across the network. McAfee offers award-winning products in each of the above categories. For metering, McAfee offers SiteMeter 5.0. McAfee offers ESD functionality in its BrightWorks integrated Network Management package, which also includes LAN Inventory 3.2 and SiteMeter 5.0. A new version of BrightWorks will be announced at NetWorld+Interop the week of March 27.


Pricing and Availability

Two year subscription fee pricing for LAN Inventory 3.2 ranges from $10.00 per node for 50 nodes to $8.00 per node for 1000 licenses. All McAfee customers are entitled to two years of free updates - both major and minor - and free unlimited telephone support. Current licensed LAN Inventory users can upgrade to LAN Inventory 3.2 at no cost.

LAN Inventory 3.2 begins shipping through electronic channels on March 10, 1995. The product will be available through retail channels on March 17. Electronically distributed versions are identical to shrink wrap versions, and contain no time-bombs or encryption.

Founded in 1989, McAfee is a leading vendor of Network Security &

Management products for the PC LAN market. Its product line is comprised of award-winning client/server applications including anti-virus, access-control, asset management, metering, electronic software distribution, print management, help desk and remote control software products. The company's products are distributed electronically through its own World Wide Web server (www.mcafee.com), Internet (mcafee.com), its HomeBase on-line service (408-988-4004), CompuServe (GO MCAFEE), America Online (MCAFEE), through computer resellers, and through a unique worldwide network of 152 authorized agents in 60 countries who provide local sales and technical support. The company is headquartered in Santa Clara and maintains sales and product development offices in Tinton Falls, New Jersey.

# News: McAfee's LAN Support Center



The Best Help Desk Workflow Manager

Simplify help desk operations

Faster diagnosis and problem-solving

Integration with other McAfee products

Customized support information management

Comprehensive, flexible reporting

Users approaching you directly with problems. Traveling to workstations for troubleshooting. McAfee knows what the average day of a network administrator can be like; that's why we developed LAN Support Center.

This powerful product allows users to generate a trouble-ticket and send it directly to your help desk; you can begin diagnostics right from your office. You'll effectively reduce the cost of software support, which can account for 44 percent of the total cost of LAN ownership, according to the Gartner Group. Best of all, it works with other McAfee products giving you a totally-integrated suite of advanced utilities and administrative tools. Bottom line? LAN Support Center can help you build the ultimate help desk.z

Simplify Help Desk Operations

LAN Support Center provides central access to support tickets, call histories and support procedure documents. Your staff can now quickly identify and diagnose problems; all through an easy-to-use Windows interface.

Never lose track of issues once they have been logged as tickets
All important information is centralized; user, staff and equipment profiles are maintained online

Intuitive Windows-based interface simplifies problem entry and tracking and allows simultaneous display of up to six tickets.

Assigns and tracks actions associated with each ticket

Faster Diagnosis And Problem-Solving

The more you know, the quicker you can solve the problem. So we built a powerful database into LAN Support Center for instant access to information regarding the management of similar situations, as well as the caller's equipment, software and call history.

Consolidates data on every help desk activity to analyze departmental and staff performance, while identifying recurring problem areas

Solve problems once; retrieve solutions to current issues from past problems with powerful keyword search

Routes tickets to appropriate support technicians

Support time reports help justify user training

Complete Integration with Other McAfee Products

LAN Support Center lets you smart-launch into other McAfee network security and management applications installed on your network; you'll have a totally-integrated suite of LAN utilities and administrative tools at your command.

Access a complete hardware and software inventory of the workstation in trouble via LAN Inventory

Take control of another workstation remotely; solve remote problems from the help desk with NetRemote

Access powerful software metering functions with SiteMeter

Customized Support Information Management

View ticket data in any way you'd like. You can also define the way screens appear to support staff members, how lists of active tickets are shown, and what information should be included in reports. The result is a truly streamlined workflow.

Definable fields and sub-categories for fast and accurate problem classification

Create and store personalized views of any cross-section of the ticket database

Add users, staff, problems types "on the fly" without exiting ticket operations

Import and export functions connect LAN Support Center with existing systems

Prevents unauthorized access to confidential information and administrative functions through multiple security levels

## Comprehensive, Flexible Reports

Supplies you with detailed software information across the network, creating the tools you can use to justify decisions, plan for future growth and track the ever-changing LAN environment.

Quickly builds custom reports

Powerful querying engine tracks critical system information

Open database ensures multiple export formats for data

## Expect More Innovation From *McAfee*

McAfee offers an integrated suite of desktop and administration utilities designed to help you operate your PC LANs more efficiently and economically. And our "best-of-breed" technology is backed by award-winning support. Whether it's our leading anti-virus products, or tools for advanced network security and management, you can expect more innovation from McAfee.

## System Requirements

Operates on a standalone machine or a LAN
DOS 3.3 or higher
Windows 3.1 enhanced mode
Disk space: 12MB required, 25MB recommended
4MB RAM

McAfee
2710 Walsh Avenue, Santa Clara, CA 95051
Telephone: 408-988-3832
Fax: 408-970-9727

Download McAfee
BBS: 408-988-4004
Internet FTP: ftp.mcafee.com

WWW: http://www.mcafee.com
CompuServe: GO MCAFEE
America Online: MCAFEE
The Microsoft Network: GO MCAFEE

McAfee and LAN Support Center are trademarks of McAfee, Inc. Other brands
and products may be trademarks of their respective holders. 1995 McAfee, Inc.
All rights reserved.

## News: Les Denend Joins McAfee Board of Directors

SANTA CLARA, CALIF. (June 14, 1995)--McAfee (NASDAQ: MCAF) today announced the appointment of Leslie G. Denend, 51, to the McAfee board of directors. Mr. Denend is currently president and CEO of Network General (NASDAQ: NETG), of Menlo Park, Calif., a $150,000,000 vendor of client/server network management products.

"We're pleased to welcome Les Denend to our board of directors," said Bill Larson, president, CEO, and chairman of McAfee. "Mr. Denend has a distinguished track record of building companies in the networking industry. His extensive industry knowledge and experience will prove useful as McAfee exploits opportunities in the emerging client/server network management market."

Prior to joining Network General in 1993, Mr. Denend held senior management posts at 3Com Corporation, Vitalink Corporation, and McKinsey & Co. He is a former White House fellow and advised both the Carter and Reagan administrations on issues of economic policy and national security. Mr. Denend is a graduate of the Air Force Academy and holds a Ph.D from Stanford University.

Mr. Denend fills a board seat vacated by McAfee founder John McAfee, who resigned today to pursue other interests. "Over the years, John McAfee has made a series of profound and lasting contributions to the company," continued Larson. "While his presence will be missed, his spirit will live on in the hearts and minds of McAfee employees and customers who have come to appreciate his relentless dedication to product quality and customer satisfaction. We wish him well."

Founded in 1989, McAfee is a leading vendor of Network Security & Management products for the client/server network management market. The company is headquartered in Santa Clara, Calif, and can be reached by phone at (408) 988-3832 or by fax at (408) 970-9727.

# News: McAfee Introduces NetRemote™ 6.0



*Aggressively Priced Remote Control and Remote Access Software for Standalone and Networked PCs*

*McAfee Establishes New Price/Performance Benchmark for Remote Control Category by Pricing NetRemote 67% Below Symantec's pcANYWHERE*

SANTA CLARA, Calif. (April 10, 1995)--In a bold move to expand its presence in the rapidly growing remote control software market, McAfee (NASDAQ: MCAF) today introduced NetRemote 6.0. With its aggressive street price of $49.95, NetRemote 6.0 establishes a new price/performance benchmark in a category now dominated by Symantec's pcANYWHERE. This low price-point will help expand the total market by making powerful remote communications capabilities affordable for all mobile workers.

"NetRemote 6.0 is an ideal remote communications solution for traveling or telecommuting users with the need to seamlessly access and control the host resources of another standalone or networked PC," said Rick Kreysar, vice president of marketing at McAfee. "The product combines the advanced features and scaleability demanded by network administrators with the ease-of-use and price-point demanded by remote end-users."

By standardizing on a single product that scales from administrator to mobile user, NetRemote customers can reduce the support cost of remote control across the enterprise. With the addition of new features and improved ease of use, NetRemote 6.0 has extended its franchise from being a power tool for network administrators to a general purpose remote communications tool for the entire enterprise. NetRemote's aggressive price-point ushers in a new era of affordability for end-users of remote communications software.

Innovative New Features Place NetRemote at the Top of its Class

NetRemote 6.0 ships complete with host and remote nodes and is packed with innovative features that place it at the top of its class. Many of the features are designed to help insulate users from the complexities of remote communication sessions.

Among major competitors, NetRemote is the first remote control product to provide bi-directional drive mapping. This technology makes it possible for host and remote PCs to seamlessly share data and execute programs from either PC, regardless of which PC actually holds the data or files being accessed. Most

remote control products only allow the remote user to map host drives, and not vice versa.

Another unique feature is NetRemote 6.0's true color support for 16-bit (64,000) and 24-bit (16,000,000) colors. True color support allows NetRemote to support the widest range of screen resolutions, and ensures that host and remote screen displays are automatically translated during connections to match the highest common screen resolutions.

Other new features include drag and drop file transfers; enhanced security options such as dial-back connections, file transfer restrictions linked to individual users and directories, screen blanking, keyboard locking and log-in restrictions; network support for IPX/SPX and NetBIOS; simultaneous multi-protocol remote connections; remote mouse and keyboard support; and remote printing.

NetRemote 6.0 Sets New Price/Performance Benchmark in Remote Control

|  | McAfee NetRemote 6.0 | Symantec The Norton pcANYWHERE for Windows 2.0 | Microcom Carbon Copy for Windows 2.5 |
|---|---|---|---|
| List price | $65.00 | $199.00 | $199.00 |
| Estimated street price | $49.95 | $120.00[1] | $130.00[1] |
| Bi-directional drive mapping | Yes | No | No |
| True 16 million color support | Yes | No | No |
| Intuitive install - automatically configures modem | Yes | Yes | No |
| Re-directed printing | Yes | Yes | No |
| Network support | Yes | Yes | Yes |

[1]Symantec and Microcom street prices from 2/20/95 InfoWorld

## Integrates with BrightWorks for Remote Support

NetRemote integrates directly into the administration console of McAfee's award-winning BrightWorks 2.0 network management suite for NetWare LANs, making NetRemote an ideal solution for network administrators and help desk personnel who need to provide remote support to their users. BrightWorks, which features help desk, asset management, license metering, software distribution and network monitoring modules, provides network administrators an integrated network support environment that makes valuable information easily accessible during remote support sessions.

## NetRemote Channel Promotions

McAfee plans to support the launch of NetRemote 6.0 with aggressive end-cap channel promotions, direct mailings, advertising in trade publications, and co-op advertising with catalog retailers. End-cap promotions will begin at 83 CompUSA stores nationwide in May, with promotions at other major regional and nationwide retailers to follow. The product will be distributed by Ingram and Tech Data.

## Pricing and Availability

NetRemote is based largely on award-winning technology licensed from Triton Technologies Inc. NetRemote 6.0 carries a suggested retail price of $65.00 and an anticipated street price of $49.95. Two year site license subscription fee pricing for NetRemote 2.0 ranges from $48.00 per node for 50 nodes to $20.50 per node for 1000 licenses. All McAfee customers are entitled to two years of free updates - both major and minor - and free unlimited telephone support. Current licensed NetRemote subscribers can upgrade to NetRemote 6.0 at no cost.

NetRemote 6.0 begins shipping through electronic channels this week. The product will be available through retail channels on April 17. Electronically distributed versions are identical to shrink wrap versions, and contain no time-bombs or encryption.

Founded in 1989, McAfee is a leading vendor of Network Security & Management products for the PC LAN market. Its product line is comprised of award-winning client/server applications including anti-virus, asset management, metering, electronic software distribution, Windows Desktop Management, print management, help desk and remote control software products. The company's products are distributed electronically through its own World Wide Web server (www.mcafee.com), Internet (mcafee.com), its HomeBase on-line service (408-988-4004), CompuServe (GO MCAFEE), America Online (MCAFEE), through computer resellers, and through a unique worldwide network of 152 authorized

agents in 60 countries who provide local sales and technical support. The company is headquartered in Santa Clara and maintains sales and product development offices in Tinton Falls, New Jersey.

# News: McAfee's NetRemote

Most Affordable Complete Remote Control

Total control, right at your desk or anywhere

Advanced security

True color support for 16 million colors

File transfer

Remote printing

NetRemote lets you do the impossible: Provide instant support of PCs from wherever you are. Imagine taking full control of a remotely connected PC, while watching customers or in-house users "show you" the problems they're experiencing. All from the comfort of your own office or home. How bout remote access to files or applications while you're on the road. It's no problem with NetRemote.

Total Control, Right At Your Desk Or Anywhere

Why jump in the car when you can fire-up NetRemote? This powerful software takes you right to the problem, and puts you in the driver's seat. Full keyboard and mouse control. Everything that's happening on the problematic PC can be controlled from your PC.

Supports both Windows and DOS

Module for remote Windows PCs is a native Windows application (not a TSR)

Advanced data compression techniques saves the bandwidth so important to growing LAN and WAN applications

Remote reboot, file transfer and dial-in support

Advanced Security

NetRemote is equipped with several security options, allowing you to choose just

how strict you'd like to be with remote control and access capabilities.

Phone Book Password prevents unauthorized viewing or changing of the Login Name and Login Password

Phone Book entries with Login Names, Login Password and answering NetRemote Host

Directory access by user

File transfer restrictions based on user login

Hosts Password Protection Option verifies your login/password

Screen blanking and keyboard locking


Full-Featured Software

NetRemote is a full-featured remote control, remote access software application for use on laptops, home Pcs and networks. You'll remain in control while reducing your support costs for customers and in-house users.

Full screen or Windowed remote sessions

WAN connection through routers or bridges

Super VGA support (1280 x 1024)

Color support for up to 24-bit (16 million) color

Extensive support for different modem types

Automatic COM port detection and configuration


Expect More Innovation From McAfee

McAfee offers an integrated suite of desktop and administration utilities designed to help you operate your PC LANs more efficiently and economically. And our "best-of-breed" technology is backed by award-winning support. Whether it's our leading anti-virus products, or tools for advanced network security and management, you can expect more innovation from McAfee.

<u>System Requirements:</u>
- 386SX or higher

- Microsoft Windows 3.1 or later with DOS 3.1 or later

- LAN connections require NetWare 3X, 4X in Bindery emulation

- 2 MB System (4MB or more recommended)

- For Remote Control, one PC must run Remote software and the other PC must run Host software

- Remote software requires Windows

- Host software operates within DOS or Windows

<u>McAfee</u>
2710 Walsh Avenue
Santa Clara, CA 95051-0963
Telephone: 408-988-3832
Fax: 408-970-9727

<u>Download McAfee</u>
BBS: 408-988-4004
Internet FTP: ftp.mcafee.com
WWW: http://www.mcafee.com
CompuServe: GO MCAFEE
America Online: MCAFEE
The Microsoft Network: GO MCAFEE

McAfee and NetRemote are trademarks of McAfee, Inc. Other brands and products may be trademarks of their respective holders. © 1995 McAfee, Inc. All rights reserved.

# News: McAfee's NetShield

<u>Best Virus Protection for Novell File Servers</u>

Comprehensive enterprise-wide network protection

World's best detection technology

Advanced network security

Today's viruses are pretty tricky. Stealth, polymorphic, encrypted and mutation engine viruses are very tough to detect. Luckily, the people of McAfee have a few tricks of their own up their sleeves. And they love nothing better than beating an ugly little virus to the punch. Take NetShield. This award-winning Novell NetWare Loadable Module is the world's best anti-virus utility for Novell file servers. It provides uninterrupted server-based virus protection--consistently detecting over 95 percent of all known viruses.

NetShield gets even better thanks to award-winning service and support. While other vendors charge fees for their advice, McAfee continues to offer the industry's finest support, free of charge. And our virus experts answer the phone within 30 seconds, so you're back up and running in minutes. McAfee also gives you continuous product and virus information and online technical support through our BBS, major online services, as well as the Internet. Bottom line? NetShield is a viruses' worst nightmare; a LAN Manager's best friend.

<u>Comprehensive Enterprise-Wide Network Protection</u>

You can't monitor every user at every workstation, 24 hours a day. But NetShield can. It's 100 percent server-based, so your file servers are always protected. And NetShield is password protected; only authorized administrators can disable it.

No software required at the workstation

Ideal for WANs

Automatically synchronizes virus definitions throughout the enterprise; your file servers will always have the latest protection available

Supports DOS, Windows, OS/2, and soon, Macintosh

<u>World's Best Detection Technology</u>

NetShield consistently detects over 94 percent of known viruses; more than 25 percent more than the nearest competitor. We make it happen by continually updating the detection data files, while adding new features and functionality. At McAfee, we're always working to set an even higher standard of anti-virus excellence. Advanced Network Security.

Highest virus detection rate in independent testing

High-performance scanning algorithms

Multiple scanning options for real-time protection

Scheduled and on-demand scanning options

Advanced protection against unknown viruses

Code Matrix and Code Trace proprietary scanning technology detects even the most sophisticated viruses


<u>Advanced Network Security</u>

Bulletproof security is the perfect complement to ironclad virus protection.

Our new NetLock file and program network security helps you enforce centralized standards by preventing updates and changes to files or program. It can even override NetWare security on directories and files, preventing local administrators from making unauthorized changes to the file server.

Password protected to prevent unauthorized access

Pick lists simplify setup options

Real-time notification of virus activity

Comprehensive, easy to understand configuration reporting utilities

Extensive log information, including start and end times of scans, scan cancellations and infections


<u>Expect More Innovation From *McAfee*</u>

McAfee offers an integrated suite of desktop and administration utilities designed to help you operate your PC LANs more efficiently and economically. And our "best-of-breed" technology is backed by award-winning support. Whether it's our leading anti-virus products, or tools for advanced network security and management, you can expect more innovation from McAfee.

System Requirements

Any Novell NetWare file server running NetWare 3.X,4X, NetWare for OS/2, or SFT III

At least 1MB of server memory

McAfee
2710 Walsh Avenue, Santa Clara, CA 95051
Telephone: 408-988-3832
Fax: 408-970-9727

Download McAfee
BBS: 408-988-4004
Internet FTP: ftp.mcafee.com
WWW: http://www.mcafee.com
CompuServe: GO MCAFEE
America Online: MCAFEE
The Microsoft Network: GO MCAFEE

McAfee and NetShield are trademarks of McAfee, Inc. Other brands and products may be trademarks of their respective holders. © 1995 McAfee, Inc. All rights reserved.

# News: McAfee Introduces NetTools® 5.2



*Simplifies Enterprise-wide Windows Desktop Management with New Global Features*

*Offers Native Support for NetWare Directory Services*

SANTA CLARA, Calif. (February 17, 1995)--McAfee (NASDAQ: MCAF) today announced that NetTools, its Windows Desktop Management solution, will gain improved global management capabilities. Scheduled to ship March 15, NetTools 5.2 will add native NetWare Directory Services (NDS) support for NetWare 4.x networks, as well as additional global management capabilities for NetWare 3.x networks.

First introduced in 1989, NetTools is the defacto standard in Windows Desktop Management. NetTools includes five integrated modules designed to automate a network administrator's most tedious and time consuming tasks. These modules include AppMan™ for menu administration, Print Manager™ for printer management, the DCL™ scripting language module for software distribution and application deployment, IniTool™ for Windows .ini file management, and Secure Station™ for desktop security and access control. Of these modules, AppMan, Print Manager, and DCL will directly benefit from native NDS support.

"With the advent and stability of NetWare 4.1, Novell has proven itself in the enterprise arena," said Rick Kreysar, vice president of marketing at McAfee. "Since NetTools appeals to large organizations who tend to be enterprise in scope, we've seen a ground swell of demand for NDS support now that NetWare 4.1 is entering widespread enterprise deployment."

"We're extremely pleased that McAfee has chosen to incorporate native NDS support into NetTools," said Scott Wells, senior manager of ISV Marketing Programs at Novell, Inc. "NetTools 5.2 is an excellent example of how enterprise network administrators can maximize the flexibility of NetWare 4.x by leveraging NDS to simplify tedious and time consuming Windows Desktop Management chores."

NetTools users in NetWare 3.x environments will also gain improved global management capabilities. Previously, NetTools allowed administrators to set application rights and privileges on a server by server basis. With NetTools 5.2, administrators can now assign global rights to program group files. The files, called "APP" files, contain a complete set of icons for each desktop, based on the restrictions placed on the user's group.

AppMan Gains Global End-User Menu Administration (NetWare, NT Server)

The NetTools Application Manager (AppMan™) uses pre-established network group rights and privileges to build and define each user's desktop. Now that NetTools supports NDS, administrators can assign and restrict application privileges based on any user object contained in the NDS directory tree.

Through AppMan, each desktop displays only the applications and icons needed by each user. AppMan effectively replaces the Windows Program Manager with a Windows-compatible interface. This capability negates the need for additional end-user training and provides administrators complete centralized control.


Global Print Management (NetWare)
The NetTools print manager makes global network printing simple and hassle-free for users and administrators. For administrators, NetTools provides complete network-wide printer configuration management and control. One unique NetTools feature is its automated printer management facility that allows administrators to remotely assign printer rights through a print list.

The NetTools print manager allows administrators to configure each network printer's queue, driver, and Windows printing options once and make them available to selected groups of network users and selected groups from the NDS directory tree. To help users help themselves and minimize printing-related support duties, administrators can create printer-specific help files for such tasks as label alignment and toner cartridge replacement.

Users are provided simplified access to printers by location, type, and description. NetTools replaces cryptic NetWare print queue names such as "HP_4_ATBLD2" with intuitive descriptions such as "Accounting's Laser Printer." Users can view each printer by queue activity before they send jobs and can be notified by a pop-up window when jobs are completed.

DCL Provides Enterprise-wide Application Control (NetWare, NT Server)
The DCL (Desktop Control Language) scripting language, which relies on syntax similar to Visual Basic, offers administrators centralized control over a wide range of network operating parameters. The benefits of DCL are especially pronounced in software distribution, because DCL frees administrators from having to repeat installation tasks. By using DCL's macro recorder, for example, administrators can perform an installation task a single time. The macro recorder captures this information in a self-running script that can then be transparently rolled out enterprise-wide to groups chosen from either NetWare 3.x binderies or the NetWare 4.x NDS directory tree. The administrator can also perform routine file maintenance tasks using DCL scripts that are automatically activated at startup, as scheduled events, or from icons.

In addition to being a powerful administrator's tool, DCL also insulates users from network complexities. As a user selects a program item from their desktop menu, for example, DCL scripts transparently attach users to file servers, map drives, change paths on-the-fly, and check a user's network membership and log-in rights.

IniTool Automates .INI File Management (NetWare, NT Server)
IniTool provides administrators complete control over .ini files. IniTool allows administrators to install a Windows application on the server and then capture the changes made to different .ini files. By comparing original .ini files to the new .ini files, IniTool creates an output file that can be used to distribute, control, and update .ini files on Windows desktops throughout the enterprise. Administrators can also make changes to specific .ini file lines or sections based on user IDs or NetWare groups.

Secure Station (NetWare)
NetTools also features a simple yet powerful workstation security and access control feature called Secure Station. Secure Station monitors workstation activity and locks the computer with a secure screen saver after a preset amount of inactivity. Users disengage Secure Station by entering their network password.

Two year subscription fee pricing for NetTools 5.2 and NetTools 5.2 for NT Server begins ranges from $30.00 per node for 50 nodes to $27.95 per node for 1000 licenses. All McAfee customers are entitled to two years of free updates - both major and minor - and free unlimited telephone support. Current licensed NetTools users can upgrade to NetTools 5.2 at no cost.

NetTools 5.2 begins shipping through electronic channels on March 15. The product will be available through retail channels on March 20, 1995. Electronically distributed versions are identical to shrink wrap versions, and contain no time-bombs or encryption.

Founded in 1989, McAfee is a leading vendor of Network Security & Management products for the PC LAN market. Its product line is comprised of award-winning client/server applications including anti-virus, access-control, asset management, metering, electronic software distribution, print management, help desk and remote control software products. The company's products are distributed electronically through its own World Wide Web server (www.mcafee.com), Internet (mcafee.com), its HomeBase on-line service (408-988-4004), CompuServe (GO MCAFEE), America Online (MCAFEE), through computer resellers, and through a unique worldwide network of 152 authorized agents in 65 countries who provide local sales and technical support. The company is headquartered in Santa Clara and maintains sales and product

development offices in Tinton Falls, New Jersey.

# NEWS: McAfee Introduces NetTools® 5.3

*New HelpPlus Trouble-Ticket Module Helps Administrators Quickly Identify and Repair Improperly Set Desktop Configuration Files*

*Augments Support for Adobe PostScript and HP Printer Drivers*

SANTA CLARA, CALIF. (July 17, 1995)--McAfee (NASDAQ: MCAF) today announced NetTools 5.3, the first Windows desktop configuration management package to integrate a trouble-ticket generator. To accomplish this, NetTools 5.3 now incorporates HelpPlus™, an ODBC-compliant trouble-ticket generator that automatically communicates with network administrator and help desk databases. The new module helps administrators quickly identify improperly set or altered desktop configuration files.

"At least 90% of Windows problems are caused by improperly set configuration files," said David Wilbanks, NetTools product manager at McAfee. ".Ini files, config.sys files, and autoexec.bat files are all subject to accidental corruption due to user error or new software installations. HelpPlus automatically sends all critical configuration information to administrators so that they can take quick remedial action when the user experiences a problem."

How HelpPlus Works
HelpPlus helps administrators acquire vital trouble-shooting information without having to leave their desk. HelpPlus constantly monitors client workstations for General Protection Faults (GPF). When a GPF occurs, HelpPlus automatically generates a trouble-ticket containing a detailed summary of system configuration information. Once the ticket is created, HelpPlus transmits the information directly into an ODBC-compliant database or to an administrator via e-mail. The trouble-ticket can then be viewed from the administrator's HelpPlus console or from any ODBC-compliant help desk software package such as McAfee's LAN Support Center™. E-mail notification is handled using VIM, MAPI, or MHS-compliant messaging formats.

In addition to HelpPlus, NetTools includes five other integrated modules designed to automate a network administrator's most tedious and time consuming Windows desktop configuration tasks. These modules include AppMan™ for menu administration, Print Manager™ for printer management, the DCL™ scripting language module for software distribution and application deployment, IniTool™ for Windows .ini file management, and Secure Station™ for desktop security and access control.

NetTools 5.3 features an improved Print Manager facility that provides support for Adobe Postscript Printer drivers, which have traditionally been the most troublesome of all printer drivers to install, configure and maintain. The new feature allows administrators to centrally assign an Adobe driver to a NetWare print queue. When an end-user selects the printer from the NetTools Print Manager, NetTools automatically installs and configures the Adobe drivers on the local workstation. This capability alleviates administrators from having to go to each workstation to manually setup and configure the driver. McAfee has also simplified support for several of the newest Hewlett Packard printer drivers as well.

Two year subscription fee pricing for NetTools 5.3 for NetWare and NetTools 5.3 for NT Server ranges from $32.00 per node for 50 nodes to $19.50 per node for 1000 licenses. All McAfee customers are entitled to two years of free updates - both major and minor - and free unlimited telephone support. Current licensed NetTools users can upgrade to NetTools 5.3 at no cost.

NetTools 5.3 begins shipping through electronic channels on August 1. The product will be available through retail channels on August 14, 1995. Electronically distributed versions are identical to shrink wrap versions, and contain no time-bombs or encryption.

Founded in 1989, McAfee is a leading vendor of Network Security and Network Management products for the PC network management market. The Company is also a leader in Internet and Web-based electronic software distribution. McAfee is headquartered in Santa Clara and can be reached by phone at (408) 988-3832 or by fax at (408) 970-9727.

## News: McAfee's NetTools

Centrally Manages Windows On Networks

Central control of Windows on the desktop

One-step printer access (NetWare Version Only)

Powerful scripting language

Help ticket generator

Security screen saver (NetWare Version Only)

Advanced .INI file manager

Easy 15-minute installation

Managing Windows desktops throughout your LAN can be a nightmare.

Lack of integration with Novell. Manual software updates at each individual workstation. The time and money you dump into management of your Windows environment can be staggering. In fact, research shows that the five-year cost of managing a single workstation exceeds $42,000.

Luckily, there's NetTools from McAfee. Thanks to a variety of powerful features, you'll regain central control of the desktops, while managing your Windows environment to the fullest.

NetTools consists of six main modules: Applications Manager, IniTool, .INI File Manager, Print Manager, Desktop Control Language, HelpPlus and Secure Station Tools.


Central Control Of Windows Desktops
McAfee gives you more thanks to Applications Manager. Its power and functionality helps you orchestrate your Windows environment, while restricting certain users and groups from access to various features and resources.

Creates a uniform desktop appearance

Maintains Program Manager's look and feel; involves no new training

Ties in with Novell's NDS or bindery to restrict access to applications by:
    user ID
    network groups
    NDS information


## One-step Printer Access (NetWare Version Only)

Print Manager configures each network printer once and make it available to selected groups of network users. Users are provided centralized printer access by location, type and description with easily recognizable names. Since printer access is tied to a user's group and user rights, users only see the printers they are authorized to use.

Centrally add/delete printer configurations

One-step process to switch printers

GUI interface to PCONSOLE functions


## Powerful Scripting Language

Desktop Control Language (DCL) is an easy-to-use, yet powerful scripting language specifically designed for integrating Windows onto a network. The integrated development environment includes a Script Editor,

Debugger, Dialog Editor and Macro Recorder.

Enables administrators to create "batch files" for Windows icons

Can be used to automate software distribution

Full set of network functions


## Help Ticket Generator

HelpPlus automates the creation of trouble tickets and collection of critical diagnostic information from users' desktops. Users can instantly send information up to administrators providing them with access to the user's WIN.INI, AUTOEXEC.BAT and other critical configuration files.
Diagnostic information includes DOS, Windows and network configuration files.

Automatically sends trouble ticket if GPF occurs on the workstation

Can send trouble ticket via E-mail to help desk staff


Security Screen Saver (NetWare Version Only)

Security is a key issue, so we built advanced protection into NetTools.
Secure Station Tools automatically secures workstations with a screen saver tied to the user's password.

Administrators can access any user-secured station through an administrative override password

Messaging and alarm functions


Advanced .INI File Manager

McAfee has simplified the most difficult part of running a Windows network. This powerful INI manager allows for central control, distribution and management. Now administrators can globally update files, while enforcing specific INI settings in the users' INI files.

Manage settings based on hardware configurations

Maintain user preferences

Manage setting based on bindery information


Easy, 15-Minute Installation

You can easily configure one centralized desktop interface that automatically recognizes all changes to both Windows and the NOS. And it doesn't even matter whether Windows is installed on local drives, network drives, or a combination of both. Network changes can even be performed while users are still logged on, and are reflected instantly on the users desktops.


Expect More Innovation From *McAfee*

McAfee offers an integrated suite of desktop and administration utilities designed to help you operate your PC LANs more efficiently and economically. And our

"best-of-breed" technology is backed by award-winning support. Whether it's our leading anti-virus products, or tools for advanced network security and management, you can expect more innovation from McAfee.

Workstation Requirements:
    386 or higher
    4MB RAM
    One 1.44 MB (3-1/2') floppy disk drive (for installation)
    MS-DOS 5.0 or higher
    Microsoft Windows 3.1 or higher, or Windows for Workgroups 3.11or higher
    VGA monitor
    Microsoft Windows compatible mouse recommended

Network Operating Requirements:
    NetWare Version
    Novell NetWare 3.11, 3.12, or NetWare 4.X

    NT Server Version
    Microsoft NTAS 3.1 or NT Server 3.5

    Banyan Vines Version (sold through NETPRO Inc.)
    Banyan Vines 4X or 5X

McAfee
2710 Walsh Avenue, Santa Clara, CA 95051-0693
Telephone: 408-988-3832
Fax: 408-970-9727

Download McAfee
BBS: 408-988-4004
Internet FTP: ftp.mcafee.com
WWW: http://www.mcafee.com
CompuServe: GO MCAFEE
America Online: MCAFEE
The Microsoft Network: GO MCAFEE

McAfee and NetTools are trademarks of McAfee, Inc. Other brands and products may be trademarks of their respective holders. © 1995 McAfee, Inc. All rights reserved.

# News: McAfee's Saber LAN Workstation

## Integrated Network Management

Managing a local area network is a big task that becomes more complicated by the minute. New Software. New Hardware. More Users. Tighter Budgets. Saber LAN Workstation offers a single-product solution to simplify this challenge. With Saber LAN Workstation, LAN Administrators can automate time-consuming tasks and save thousands of dollars by managing network assets more efficiently.

## Managing the Desktop

Whether your environment is Windows, DOS or both, Saber LAN Workstation (SLW) saves you time and hassle. SLW's award winning menuing helps you improve security and provide a consist desktop interface by centrally controlling program groups and icons. SLW gives you control of each user's desktop through centralized management of INI, AUTOEXEC and CONFIG files. Think of the problems you'll avoid by stopping unauthorized changes to these files. When problems do occur, you can access the user's workstation with Saber's integrated remote control. No more "sneakernet".

## Managing Software Assets

Do you have legal licenses for all your users? Could you save money by sharing licenses? With Saber LAN Workstation you can be sure you are "legal" and save thousands of dollars in license fees. SLW collects software inventory information, meters application usage and let's you control the number of copies used. With SLW's comprehensive reporting you can quickly summarize the details and insure you're getting the most out of every license dollar. And, when you install new software, Saber's software distribution "wizard" helps you finish the task in record time.

## Managing the Network

Saber LAN Workstation helps you keep the network running and reliable. When disks run out of space or systems go down, SLW alerts you. Managing hardware upgrades and changes is easier because SLW's hardware inventory gives you accurate records of all network components. Best of all, SLW works with

Netware, NT and Banyan based networks, including full support of NDS.


## Managing the Desktop

Simplify access to, and control of, Windows-based applications, using Saber's network-intelligent replacement for Windows Program Manager

View and manage real-time information through a centralized management console

Automatically manage .INI files for groups of users in a Windows-based environment

Increase response time to end-user needs and eliminate "sneakernet" with remote control of client workstations

Customize desktops by user name, workgroup, network address, hardware configuration or operating system

Save valuable computer memory with 0 KB menu for launching DOS applications

Protect important and/or confidential information with on-demand workstation security

Gain greater security and customization with Saber Control Panel, a replacement for Windows Control Panel

Customize personal menus using drag-and-drop technology


## Managing Software Assets

Easily and automatically inventory all network and workstation software from one central location

Track, control and report on all DOS and Windows application usage, including suites, with software metering

Automatically distribute software from one central location, and simplify applications updates/ upgrades with SaberBASIC scripting language

Automatically distribute updates of desktop or network control files


## Managing Network Needs and Hardware Assets

Easily and automatically inventory all network hardware from one central location

Use the job scheduler to track, prioritize and queue administrator-defined network activities

Receive timely alarm notifications via pager or MHS, MAPI or VIM E-mail systems or network message

Receive timely reports on disk space usage and notification when maximum disk space thresholds are reached

Automatically display a single report on network users, groups, servers, etc. with the NetWare bindery viewer

Efficiently organize and automatically activate and track network jobs such as backups and virus scans

Easily control and manage NetWare, Microsoft NT Server network printing resources

Successfully integrate management procedures with Novell's NetWare Directory Services (NDS)


The Only Integrated Single-Product Solution With: Saber Menu Systems for DOS and Windows
    Application Metering
    Remote Control
    Software Distribution
    SaberBASIC Scripting Language
    Hardware Inventory
    Software Inventory
    Printer Management for DOS and Windows
    Job Scheduling
    Disk Monitoring
    Event Management
    Workstation Security
    Alarm Notification


**System Requirements**
    IBM or Compaq personal computer or compatible
    1 MB of memory
    DOS 3.1 or higher
    Windows 3.1 or higher

Network Compatibility
        Novell NetWare 2.X, 3.X, 4.X
        Microsoft Windows NT Server
        Banyan Vines
        DEC PathWORKS
        IBM LAN Server
        Artisoft LANtastic
        MS-NET-based networks

<u>McAfee</u>
2710 Walsh Avenue, Santa Clara, CA 95051
Telephone: 408-988-3832
Fax: 408-970-9727

<u>Download McAfee</u>
BBS: 408-988-4004
Internet FTP: ftp.mcafee.com
America Online: MCAFEE
CompuServe: GO MCAFEE
WWW: http://www.mcafee.com

McAfee and Saber LAN Workstation are trademarks of McAfee, Inc. Other brands and products may be trademarks of their respective holders. © 1995 McAfee, Inc. All rights reserved.

# News: McAfee to Acquire Saber Software Corporation

*Creates PC Network Management Market Leader*

SANTA CLARA, CALIF. (May 30, 1995)--McAfee (NASDAQ: MCAF) today announced that it has signed a definitive agreement to acquire Saber Software Corporation (NASDAQ: SABR) of Dallas, Texas. The combined companies will be the market leader in the worldwide PC network management market. According to IDC, the acquisition will give McAfee a 41% U.S. market share in the integrated PC network management suite market. In addition, McAfee will have worldwide leadership in the software metering, desktop management and anti-virus markets.

Under terms of the acquisition agreement, Saber shareholders will receive 0.31326 McAfee shares for each Saber share. The transaction will be accounted for on a pooling-of-interests basis. The acquisition is subject to a number of conditions including the approval of Saber shareholders. Based on McAfee's Friday closing price of $29.00 per share, the transaction is valued at approximately $40,600,000.

McAfee's acquisition of Saber will be its third PC network management acquisition in the last 18 months. During 1994, McAfee acquired Brightwork Development and the products of Automated Design Systems.

"We've committed to our customers and stockholders to be a market leader in client/server network management software," said Bill Larson, president, CEO, and chairman of McAfee. "Our acquisition of Saber is consistent with that ongoing strategy. As the PC network management market consolidates around a few vendors, we plan to continue enhancing our market position through internal development and external acquisition."

"McAfee's strengths in anti-virus and metering technology complement Saber's strengths in desktop and network management," said Jeffrey Farris, CEO of Saber. "McAfee's established electronic software distribution channel complements our international direct sales, VARs and corporate resellers."

McAfee remains committed to the current development plans for both companies. Major upgrades planned for 1995 include McAfee's BrightWorks 3.0, SiteMeter 6.0, LAN Inventory 4.0, NetTools 6.0, and Saber's Saber LAN Workstation 6.0. McAfee will maintain Saber's Dallas office as a sales, development, and technical support center.

Founded in 1989, Saber Software is a recognized pioneer in integrated network

management solutions for a variety of client/server network environments.

Founded in 1989, McAfee is a leading vendor of Network Security & Management products for the PC network market. The company is headquartered in Santa Clara, Calif.

Saber is a trademark of American Airlines, Inc. Saber Software Corporation is not affiliated with American Airlines, Inc. or its SABRE Travel Information Network.

McAfee and Saber Combine Complementary Strengths to Create Worldwide PC Network Management Market Leader

|  | McAfee | Saber |
|---|---|---|
| Established VAR and corporate reseller channel |  | X |
| Consulting services |  | X |
| European direct sales operation with offices in the U.K., France and Germany |  | X |
| Established PC LAN management customer base and technology with combined U.S. market share of 41% (IDC) | X | X |
| Financial strength | X | X |
| Established electronic distribution channel | X |  |
| Established retail channel presence | X |  |

| Established anti-virus and metering customer base and technology | X |

# News: McAfee's VirusScan



1 in Virus Detection and Sales

Consistently rated 1 in virus detection

Easy to use graphical user interface

Seamless command-line operations for automatic protection

Fastest version of VirusScan ever!

Detects even the most sophisticated viruses, including stealth, polymorphic, encrypted and mutation engine viruses

Provides advanced protection against unknown viruses

Scans all system areas to provide comprehensive protection includes local and network drives, CD-ROMs, floppies, boot sectors and partition tables

Full memory scanning includes upper, high and DOS memory

Small memory footprint now works with all popular network configurations

Memory resident protection uses as little as of 0Kbytes of conventional DOS memory

Online Database of virus information

Viruses on computers can cause days of lost work and important data by destroying your computer files. According to independent studies, over 64% of Fortune 1000 companies have experienced the damage caused by computer viruses in the last year. To combat this, there is VirusScan by McAfee, the world's best-selling anti-virus software. It protects your valuable files with the most rigorous and thorough virus protection in the world. McAfee products are used by millions of users and over 20,000 corporations in more than 52 countries to protect their mission critical information.

Best Virus Detection in the World

McAfee's VirusScan provides the best protection of any anti-virus software product. In independent testing, it consistently detects over 97% of known

virusesmore than 25% more effective than its nearest competitor. We do this by providing the most advanced technology and by providing monthly updates to the detection and removal data files.

Consistently detects over 97% of known viruses, compared to 78% by Norton and 69% by Central Pointover 25% more effective
Code Matrix Scanning and Code Trace Scanning proprietary scanning technology finds even the most sophisticated viruses.

Provides advanced protection against unknown viruses

More free updates than any other anti-virus software for the most-up-to date protection


Outstanding Service and Support

McAfee's award-winning service and support is the best in the industry.

We can provide virus solutions within 48 hours of receipt of a new virus.

And, our virus experts answer the phone within 30 seconds, so that you
are back up and running within minutes, minimizing the anxiety and damage that a virus can cause.

New features and functionality offered in updates, not merely new anti-virus strings

Non-stop access to product and virus information and online technical support through McAfee's BBS, Internet, CompuServe and America
Online forums, and fax information systems

Access to our acclaimed Virus Emergency Response Center


Unmatched Flexibility

VirusScan provides high levels of flexibility so that you can tune how it detects viruses and what drives and files to scan. Scheduling capabilities enable you to set up scans to run automatically when you are not using your machine. This means your critical system resources are not tied up while you scan. It is these customization features that allow you to have maximum protection with little interruption to your normal daily tasks. A detailed activity log keeps track of the results of all scans performed, so that you always know you are virus-free and safe.

Pre-defined performance packages provide recommended scanning options for maximum, fast and optimal scanning for your system

Integrated scheduler maintains unlimited numbers of scheduled scans for automatic protection without any user intervention

Fully definable profiles allow you to fully customize and run VirusScan with the push of one button

System Requirements

- Any IBM or 100% compatible personal computer

- Local hard disk required, diskless workstations supported for network operations

- Mouse recommended for use with graphical versions

- DOS

- Minimum of 360K RAM

- MS-DOS 3X, 4X, 5X, 6X or Novell DOS 7.0

- OS/2

- OS/2 2.1 or OS/2 for Windows 2.1

- Network Operating Systems Supported
  Novell NetWare 3X, 4X, SFT III, NetWare for OS/2 4.10
  NetWare Lite
  Artisoft Lantastic 6.0
  Banyan Vines
  Sun NFS

McAfee
2710 Walsh Avenue
Santa Clara, CA 95051-0963
Telephone: 408-988-3832
Fax: 408-970-9727

Download McAfee
BBS: 408-988-4004

Internet FTP: ftp.mcafee.com
WWW: http://www.mcafee.com
CompuServe: GO MCAFEE
America Online: MCAFEE
The Microsoft Network: GO MCAFEE

McAfee and VirusScan are trademarks of McAfee, Inc. Other brands and products may be trademarks of their respective holders. © 1995 McAfee, Inc. All rights reserved.

# News: McAfee's SiteExpress

*Reduces The Cost Of Enterprise Software Distribution*

Full enterprise software distribution

Most flexible and complete distribution options

Completely efficient software distribution

Extensive but easy scripting capabilities

Comprehensive, enterprise-wide management reports

SiteExpress is a powerful, state-of-the-art distribution product that lets you install and upgrade software throughout the enterprise, without leaving your desk. Over LANs and WANs. Across continents. All in a matter of minutes, not days.

Think about it: Centralized distribution to servers around the world - over IP and IPX. Easy installation of major desktop operating systems like DOS, Windows, Windows 95, and OS/2.

The ability to modify workstation configuration files at any remote site, right from your desk. SiteExpress offers the ultimate in control, convenience and efficiency. You'll gain greater consistency across the enterprise, while creating time to handle other network administration tasks.

Applications are becoming more complex. And the enterprise continues to grow. So it's time to upgrade the way you distribute and install software. It's time to deploy SiteExpress.

Full Enterprise Distribution

SiteExpress puts true functionality at your fingertips. You'll have the power to distribute, install, and update software (from applications to system files) at sites, (servers, and workstations) across your LANs and WANs.

Distribute software from server-to-server over IPX and IP

Supports both NetWare 3.X and NetWare 4.X bindery objects and NDS groups and users

Contains SNMP traps for alerting and integration into other platforms

Automatically discovers all routes between a distributing server and receiving server(s). SiteExpress can make the selection automatically or you can choose the optimal route.

Supports desktops that run DOS, Windows, Windows 95 and OS/2.


## Most Flexible and Complete Distribution Options

SiteExpress includes several advanced options that can drastically simplify the software distribution process.

Quick Start feature helps you become productive with the program right from the beginning

Powerful task list feature allows you to populate a package with unlimited filesets, scripts and/or executables as well as indicate the order in which they should be executed.

Distribution recipients may be selected from Novell groups, users, and/or servers

Undo feature allows you to reverse any action executed by a failed package.

Assign package dependencies to insure required software or drivers exist before installing a new package

Schedule when workstations, groups, or servers are to receive a package

Mandate that a package is received or allow the user to select a more convenient time

If an error occurs during distribution, you're notified and SiteExpress automatically restores the workstation to its original state

Updates may occur at login, logout or whenever the software distribution client is executed


## Completely Efficient Software Distribution

SiteExpress won't disrupt you, your network, or your clients. It uses state-of-the-art technology to insure that network performance is all but unaffected by software distributions.

Reduces the software distribution load by supporting server-to-server and multiple-server distribution over IPX and IP

Files transferred over the network are automatically compressed and decompressed to reduce network traffic

The originating server handles scheduling, feedback, and transferring of files, leaving the administrator console free for other tasks

No TSRs are required on the clients' PC

Extensive, but Easy Scripting Capabilities

Customize distributions with easy to use scripting capabilities. Whether you need to compare installation requirements to inventory, edit ini files, or create program groups, SiteExpress handles scripting.

Choose from QuickScripts or PowerScripts depending upon your individual needs:

QuickScript allows for fast and easy implementation through a scripting language specifically designed for software management. QuickScript provides complete system file editing in seconds.

PowerScripts are based on a powerful visual basic-like programming language. The capabilities of software distribution with PowerScripts are boundless. PowerScript: includes a dialog box editor, smart mouse and keyboard recorder , and a debugger

Select one of our sample scripts to get started (Win 95, VirusScan, etc...)

Comprehensive, Enterprise-wide Management Reports

Now you can have detailed information about your entire enterprise.

Choose from summary, pre-defined, or customized reports to check the status of all your software installations and upgrades.

Summary reports at the package level describe when distribution will begin, package status, number of packages installed successfully or unsuccessfully

Summary reports can be "drilled down" for more specific details on a given package and workstation

Pre-defined reports can be customized to accommodate your specific requirements

Powerful reporting engine provides the flexibility needed to design your own tailored reports

Supports industry-standard DBF file format providing access to many popular databases, spreadsheets and report writer


**System Requirements:**

**Server Requirements:**
    Network Operating System: Novell NetWare 3.X and 4.X
    Network Disk Space: 20 MB required; 40 MB recommended

**Memory Requirements**
    3.X environment:
        8 MB required, 16 MB recommended
    4.X environment:
        16MB required, 40 MB recommended

**Administrator Console Requirements:**
    Operating System: DOS 5.0 or higher
    User Interface: Microsoft Windows 3.1X in enhanced mode
    CPU: 386SX or higher
    RAM: 4 MB
    Monitor: VGA or better

**DOS Workstation Requirements:**
    CPU: 286 or higher
    Operating System: DOS 3.X or higher
    AM: minimum of 640K

**OS/2 Workstation Requirements:**
    Operating System: OS/2 v2.1 or higher
    Novell OS/2 Requester 2.21 or higher


McAfee
2710 Walsh Avenue, Santa Clara, CA 95051
Telephone: 408-988-3832
Fax: 408-970-9727


Download McAfee

BBS: 408-988-4004
Internet FTP: ftp.mcafee.com
WWW: http://www.mcafee.com
CompuServe: GO MCAFEE
America Online: MCAFEE
The Microsoft Network: GO MCAFEE

McAfee SiteExpress are trademarks of McAfee, Inc. Other brands and products may be trademarks of their respective holders. © 1995 McAfee, Inc. All rights reserved.

# News: McAfee's SiteMeter



*The Leader In Enterprise Software Metering*

Full enterprise support

Award-winning software license metering

Significantly reduces software costs

Comprehensive flexible reports

You'll never have to worry about a software audit if you're running SiteMeter from McAfee. Now you'll always know if you're complying with your licensing agreements. There will be no doubt when it comes time to justify current software expenses and predict your future software needs.

And you'll feel secure knowing that SiteMeter is a newly-enhanced version of the software that received the LAN Magazine Product of the Year in 1994.

Bottom line? You know network administration; McAfee knows metering. Together, we've got your enterprise covered.

Full Enterprise Support

SiteMeter is the first enterprise-wide software metering tool. And thanks to frequent updates and refinement, it's still the best. The console of this native Windows application even facilitates the integration of other McAfee network security and management products. You now have the opportunity to create a totally-integrated suite of utilities and administrative tools for the enterprise.

Maximize software investments by sharing applications across your entire organization

Licensees may be transferred temporarily or permanently through automatic load balancing

Supports IP, so SiteMeter is truly enterprise-ready

Administrator options allow for total control over enterprise metering

Centralized administration for the management of all servers from one screen

Supports global reporting of application license compliance and usage.

Users are provided with a single report source that will prove license compliance throughout an internet, as well as track software usage statistics

Consolidates reporting of metering data from multiple servers and locations

Smart Launch diagnostics, support and anti-virus functions for each user


Award-Winning Software License Metering

This comprehensive solution is the result of over six years of software metering development. Frequent updates and refinements have led to a highly functional and powerful product that puts you in control.

Enforces software license agreements or simply tracks usage

Totally NLM-based metering for file server applications; no workstation agent management required

Automated notification of available applications, automated to locked out clients via queue back

Meters DOS, Windows, Mac and OS/2 applications

Full NDS support

1,000 user support

Application metering access based on Novell groups

Timed-based restriction of access to metered applications

Meter individual files of suites as well as whole suite applications

Allows a view into individual application usage

VIP metering.


Significantly Reduces Software Costs

Why buy more software than you need? SiteMeter ensures efficient usage of your valuable WAN resources through accurate tracking of client asset utilization. You'll always have a clear, concise picture of the enterprise.

Eliminate excess licensing by making purchases based on actual client software usage

Reallocate resources through client application usage; determine the power users

## Comprehensive, Flexible Reports

Now you can generate hard-working reports that supply you with detailed application usage information across your network. You'll have everything you need to justify decisions, plan for future growth and track the ever-changing network environment.

Enterprise reporting

SPA-recognized reporting

Quickly build custom documents through the powerful report

Open database ensures multiple export formats of data

## Expect More Innovation From McAfee
McAfee offers an integrated suite of desktop and administration utilities designed to help you operate your PC LANs more efficiently and economically. And our "best-of-breed" technology is backed by award-winning support. Whether it's our leading anti-virus products, or tools for advanced network security and management, you can expect more innovation from McAfee.

## System Requirements

Network requirements
Operating System: Novell NetWare 3X, 4X
Disk space: 13 MB required, 25 MB recommended
Database: BTRIEVE NLM/BREQUEST.EXE 6.1 or greater

Administrative Console
DOS 5.0 or later

Microsoft Windows 3.1 in enhanced mode
386SX or higher
4 MB RAM


*McAfee*
2710 Walsh Avenue, Santa Clara, CA 95051
Telephone: 408-988-3832
Fax: 408-970-9727


Download McAfee
BBS: 408-988-4004
Internet FTP: ftp.mcafee.com
WWW: http://www.mcafee.com
CompuServe: GO MCAFEE
America Online: MCAFEE
The Microsoft Network: GO MCAFEE

McAfee, Smart Launch and SiteMeter are trademarks of McAfee, Inc. Other
brands and products may be trademarks of their respective holders. © 1995
McAfee, Inc. All rights reserved.

## News: McAfee Releases VirusScan for Windows 95 and Announces Windows NT Support

*First To Ship Native 32 Bit Virus Protection with an Explorer Interface
for Tight Integration within Windows 95*

SANTA CLARA, CALIF. (August 18, 1995)--McAfee (NASDAQ: MCAF) today announced VirusScan for Windows 95, a native 32-bit anti-virus solution designed to exploit the new capabilities of Windows 95. VirusScan for Windows 95 is the latest addition to McAfee's best-selling VirusScan desktop anti-virus family, which currently commands a worldwide market share of 67%, according to IDC. The product, which ships August 21, is approved by Microsoft to carry the Windows 95 Logo and is certified by the National Computer Security Association. VirusScan 2.25, which includes Windows NT support, will also ship on August 21.

"The excitement and anticipated demand for Windows 95 clearly makes it a prime target for virus writers. Windows 95 is also especially susceptible to viruses because it does not include bundled anti- virus capabilities," said Scott Gordon, anti-virus product manager at McAfee. "VirusScan's new 32-bit architecture offers superior virus detection, while its exceptional Windows 95 explorer interface makes it appear as an extension of the operating system and encourages regular use--a key for virus prevention."

VirusScan First to Offer Windows 95 Explorer Interface
VirusScan for Windows 95 ("VirusScan") is the industry's first anti-virus solution shipping with a Windows 95 explorer interface. VirusScan features full support for Windows 95 conventions such as 32-bit protected operation, context menus, property pages, browsers, and long file names. For example, to quickly launch a virus scan from a Context Menu within Explorer, users simply right mouse click on any folder, drive, .exe, or .com icon. The VirusScan menu item will appear along with the other items in the context menu. An automated installation routine performs a complete best-practice installation in under a minute.

"We were very impressed with VirusScan's explorer interface," said beta tester Bill Heldman, a systems administrator at TomTec Imaging Systems, a developer of cardiac ultrasound software based in Boulder, CO. "The installation is very quick and intuitive, and it gives me the flexibility to perform immediate scans. The product's ability to launch off of Windows 95 drive, folder, and executable objects is cool. This level of integration is a network administrator's dream come true. We've already found viruses with it."

VirusScan gives users the choice of performing virus scans at system start-up, on-demand, or on-access. VirusScan's virtual device driver (VxD) technology

performs memory scanning during initial operation, while on- access scanning technology captures viruses during the launch of any executable files. VirusScan ships with a pre-configured list of recommended scanning options. Users can also customize the options to meet their exact requirements. From the VirusScan for Windows 95 property page, users can define which drives, folders and file types will be scanned for infection. Users and administrators can also choose what actions VirusScan will take when a virus is discovered. For example, VirusScan can be configured to continue the scan after a detection; prompt the user for instructions; automatically clean the infection; or automatically delete the file. All settings can be saved for subsequent use or even as a Windows 95 Start-Up application. Records of all virus incidents are maintained in VirusScan's activity log, which graphically represents actions and also highlights important virus and infected file facts.

Consistently Delivers Superior Detection
The product incorporates award-winning, world-proven virus scanning and removal technology which consistently delivers top industry ratings. This technology, called Code Matrix Scanning TM and Code Trace Scanning TM, enables VirusScan to accurately detect over 5,100 viruses. VirusScan detects known and new viruses, including boot viruses; file viruses; multi-partite viruses; stealth viruses; encrypted viruses; and polymorphic viruses. A key reason for McAfee's consistently high detection rate is VirusScan's 67% world-wide market share and correspondingly large installed user base. By having more users than any other vendor, McAfee is often the first to learn about and react to new and emerging virus threats.

McAfee also utilizes a worldwide support team of virus researchers, programmers, and technical support personnel to respond quickly to customers' virus threats. The Company's acclaimed 24-Hour Virus Emergency Response Center is trained to handle customer problems swiftly and decisively.

"We recently had to rid our computers of the Monkey virus discovered by VirusScan," said the support director at Walker Process Equipment, Aurora, IL. "McAfee took the time to explain in great detail the procedure required for [Monkey's] removal. The technician was very helpful, pleasant and polite. We choose McAfee because of their quick response ability; a must in virus protection with all the new viruses being introduced. The technical support staff is a great asset to McAfee."

McAfee adds monthly updates to the detection capabilities of the VirusScan family to counteract the estimated 100 new viruses that appear each month. These updates are provided free to all McAfee maintenance subscribers and are available both electronically and on disk.

Unique Migration Pricing and Availability

To ensure a safe migration from Windows 3.1 to Windows 95, VirusScan for Windows 95 will for a limited time also include protection for Windows 3.1 systems. VirusScan for Windows 95 will intelligently install the correct components for both Windows 3.1 systems as well as Windows 95 systems. This will not only protect current Windows 95 users, but also eases the transition and support costs for corporate and individual clients who will eventually migrate to Windows 95. Current subscribers of VirusScan for Windows can upgrade to VirusScan for Windows 95 at no additional cost. The product carries a list price of $65.00 and an estimated street price of $45.00. VirusScan users who are not currently under maintenance may obtain VirusScan for Windows 95 by purchasing a maintenance subscription for $60.00. This maintenance subscription will provide free updates - both major and minor - for two years. VirusScan site license subscription pricing ranges from $50.00 per node for 25 nodes to $20.50 a node for 1000 nodes and covers both Windows 3.1, Windows 95 and Windows NT.

An evaluation version of VirusScan for Windows 95 1.0 is now available through various online sources such as McAfee's Web and FTP sites (http://www.mcafee.com or ftp.mcafee.com), CompuServe (GO MCAFEE), America Online (MCAFEE), Microsoft Network (GO MCAFEE) or McAfee's HomeBase BBS (408- 988-4004). The product will be available through retail channels on August 24. Electronically distributed versions are identical to shrink wrap versions, and contain no time-bombs or encryption.


VirusScan Joins McAfee Family of Windows 95 Solutions

VirusScan for Windows 95 is one of many McAfee products designed to support the Windows 95 operating system. Last week, McAfee introduced SiteExpress 3.0, a package that automates enterpise distribution and installation of both the Windows 95 operating system and Windows 95 applications. McAfee's remaining network management, configuration management, remote control and asset management solutions will become enhanced during the next quarter with full 32-bit Windows 95 support.


Company Background

Founded in 1989, McAfee is the leading vendor of Network Security and Network Management products for the PC network management market. The Company is also a leader in Internet and Web-based electronic software distribution. McAfee is headquartered in Santa Clara and can be reached by phone at (408) 988-3832 or by fax at (408) 970-9727. McAfee's Web address is http://www.mcafee.com.

# News: McAfee's VirusScan For Windows 95

1 In Virus Detection and Removal

1. "Native Windows 95 Interface"
2. "Windows 95 property pages for convenient scan configuration"
3. "Quickly identify virus threats within the intuitive Scan window"
4. "Context-sensitive help is only a click away"
5. "Instantly execute pre-defined scans"


Features

Superior Detection
Comprehensive Protection
Unmatched Flexibility
Convenient to Use
Unrivaled Support and Service


Every month, over 100 new viruses damage data and productivity. These viruses are unintentionally received through disks, bulletin boards, E-mail, the internet and networks. *Why have millions chosen McAfee VirusScan for their security? Virus detection, removal and support services*.

According to IDC, McAfee has 76% worldwide unit marketshare for anti-virus software. Millions of individual and corporate VirusScan customers and agents in over 65 countries enable us to analyze more viruses first and demand us to resolve incidents fast. This tremendous installed user base and exhaustive testing, including monthly NCSA and VSUM virus library certifications, provide McAfee with hundreds of samples per month.

Consistent virus detection and removal requires a sizable staff of skilled and experienced virus researchers, engineers and support teams. We are constantly expanding our capabilities; recruiting expert virus researchers, streamlining support mechanisms and designing groundbreaking virus extrapolation tools. This customer-driven effort delivers significant monthly updates and the best reviews in the industry

McAfee is dedicated to strengthening the industry's 1 anti-virus solution and our customer's security. VirusScan for Windows 95 is the ideal solution for companies and individuals either migrating from Windows 3.1 to Windows 95 or just just purchasing Windows 95.

System Requirements

Windows 95
CPU capable of running Windows 95
Storage: 1 MB


<u>World's Best Virus Detection</u>
VirusScan superior detection rates are the envy of the industry; exceeding more than 20% better than the number two market leader.

Consistently detects over 96% of the more than 5000 known viruses maintained by independent testing labs.

NCSA certified - assures monthly virus identification standards from the National Computer Security Association's virus test library.

Awarded Windows 95 logo - meets standard Microsoft Windows 95 requirements.

Award-winning, patented Code Trace TM and Code Matrix TM technology to efficiently pinpoint known, generic *and even new and unknown* boot, file, multi-partitite, stealth, mutating, polymorphic and encrypted viruses.

World Proven--employed by more than 20,000 corporations and organizations worldwide.


<u>Comprehensive Protection</u>
VirusScan natively supports Windows 95 with an extensive array of features to keep your system immune from viruses.

Enhanced 32-bit scanning engine assuring fast and protected virus scanning. New Virtual Device Driver (VxD) technology to automatically detect viruses in memory.

On-access scanning technology to capture viruses on program execution for constant, transparent virus isolation.

Scans all system areas to provide extensive security including local and network drives, CD-ROMS, floppies, boot sectors, file allocation and partition tables, folders, files and compressed files.

Accurately cleans most virus infections from files, master boot sectors, partition

tables and memory back to their virus-free state.

New Recursive scanning to identify and repair complicated, multiple reinfections.

Unmatched Flexibility
VirusScan easily adapts to your computing environment and productivity needs. New *Migration installation* allows VirusScan to intelligently install on either Windows 3.1 or Windows 95 computers - protecting present and future Windows 95 users.

Emergency scan disk to eliminate viral damage even if Windows 95 becomes corrupted.

Multiple on-demand scanning options such as file, file type, detection action and reporting to meet all user requirements.

Pre-defined actions on detection including logging, moving, deletion and isolation for unattended operation.

New virus response prompt with customized messaging to take swift response to identified viruses.

Convenient to Use
VirusScan exploits Windows 95 and has been designed specifically for Windows 95.

Industry first, anti-virus explorer interface supporting Window 95 property pages, browers, long file names, context menus and context-sensitive help for point and click operation.

Instantly execute pre-defined scan configurations from the desktop, through object menu items or during Windows 95 system startup.

Informative *Scan* window, *Activity Log* and *ItemInfo* provide a detailed audit of all scanning and infection results.

Enhanced Virus encyclopedia enables users to learn more about various virus types.

Unrivaled Support and Service
The mere numbers of our individual and corporate clients, as well as our industry pioneering experience enables McAfee to consistently solve more customer virus problems better than any of our competitors.

*With the purchase of McAfee's two year subscription license:*

Monthly virus signature updates and product upgrades for two years to insure the most current protection available.

Easy maintenance - download monthly updates from McAfee or have the updates mailed directly to you.

FREE technical support provided by our expert team of virus professionals who will stay with you through your virus dilemma from system analysis to proper recovery.

24 hour, 7 day access to product updates, virus news, product information and online technical support through McAfee's BBS, the Internet, CompuServe, America Online and MS-Network.

FREE business-hour access to the acclaimed *McAfee Virus Emergency Response Center* and optional access to virus emergency technicians 24 hour/day, 365 days/year.

Unique World-wide network of McAfee agents - each of which may provide timely responses to local virus threats and electronically forward suspicious files to McAfee research.

Risk Free!   As always, VirusScan is backed by McAfee's unconditional, 30-day money-back guaranty.

McAfee is a registered trademark, and McAfee Associates, Inc., NetShield, VirusScan, Code Matrix and Code Trace, and Scan95 are trademarks of McAfee Associates, Inc. Other brands and products referenced are trademarks of their respective holders.   McAfee Associates, Inc. 1995. All rights reserved.

## News: Close-Up 6.0's New Self-Install Technology Revolutionizes Remote-Communications Industry



SANTA BARBARA, CA, March 1, 1995--Close-Up 6.0, the latest version of the award winning remote-control software from Norton-Lambert Corp. reaches a new level of novice-oriented design with their innovative self-installation program. Close-Up's new "Expert System" eliminates the time and hassles of configuring remote control software for a user's specific computer system. With support for both Windows and DOS, Close-Up actually diagnoses the users hardware and automatically finds the best possible configuration for Close-Up on their system. Better still, Close-Up not only performs diagnostics, it then *records* the users hardware setup for future reference, automatically creating a detailed log of their system setup.

Close-Up's Expert System Diagnoses the PC's System and Self-Installs According to Ward Fitch, Technical Support Manager for Norton-Lambert, "Most remote programs can take hours to configure, and even if you're a technical expert, it's intimidating. With Close-Up 6.0, we wanted to make installation so easy that even people who knew little about computers could do it. All you need to know when installing Close-Up is your modem name. Close-Up automatically determines the rest. It looks at your hardware setup and determines the proper baud rate, com ports and video resolution. It looks at the Windows and network drivers and identifies any known compatibility problems and tells the user what they need to do to fix it. It scans the SYSTEM.INI, WIN.INI and CONFIG.SYS files for any known conflicts. If a competitive remote is installed, it will even give you the option of removing their drivers." After installation is complete, Close-Up composes a report detailing the system's setup that users can refer to if they ever need technical help.

Point & Select from Over 715 Supported Modems
To begin system diagnostics and installation, Close-Up 6.0 simply needs the user to select the modem type, which is easily found in the point & select list of over seven hundred and fifteen (715) modems. With the most exhaustive list of supported modems available, Close-Up is uniquely able to run with virtually every type of modem. If not listed, the user can simply edit or add their modem to Close-Up's list, another accommodating feature that competitive remotes fail to include.

Now retailing for $199.00 for both *Host* and *Remote*, Close-Up 6.0 offers a number of new advances in remote-control software including an enhanced Photographic MemoryTM system for faster Windows speed, Host Windows interface, faster file transfer, virus checking security and remote printing in

Windows & DOS. For more information on Close-Up's other innovations, or for a review copy, call (805) 964-6767.

<u>Close-Up 6.0 Introduces Self-Install Technology to Simplify Remote-Control Industry</u>

Close-Up 6.0 Introduces Self-Install Technology
to Remote-Control Industry

Close-Up 6.0 Simplifies the Remote-Control Industry
with New Self-Install Program

Close-Up 6.0 Introduces New Self-Install Technology
to Growing Remote-Control Market

Close-Up 6.0 Introduces Self-Install Technology
to Simplify Remote-Control

Close-Up 6.0 Introduces Self-Install Technology
for the Remote-Control Novice

## News: New Close-Up/LAN Pro Offers First and Only Windows Remote for Network Classrooms & Workgroups



SANTA BARBARA, CA, May 30, 1995--Norton-Lambert Corp., developers of the top-rated modem remote communications software Close-Up, is shipping this week a new release of their network product, Close-Up/LAN Pro. This new release, version 6.1, is the first and only network communications software to support classroom and workgroup environments in Windows and DOS. Close-Up/LAN Pro expands Norton-Lambert's modem remote-control technology to LANs and WANs, allowing users to easily share screens and keyboards with other network PCs. Close-Up/LAN Pro offers all the popular features of the award-winning Close-Up 6.0 modem remote product including fastest Windows screen refresh, Expert System self-installation, Non-Intrusive Technology, point & select file transfer, virus checking, remote printing, even a script language for automating communications.

Workgroup and Classroom Interaction in Windows
While Close-Up/LAN Pro supports the *one-to-one* connections ideal for network supervision and resource sharing, this unique product also supports the *many-to-one* connections ideal for interacting in workgroup and classrooms--a powerful capability of networks that has gone virtually untapped. While competitive products may offer a variety of *one-to-one* solutions for Windows, only Close-Up/LAN Pro allows *group connections in Windows*. For the first time, a group of users (or *all* the users on the LAN) can view and control Windows and DOS applications running on a "Host" PC. All screens mirror the Host and all keyboards are live. "Only with Close-Up/LAN Pro can a group of associates share

Windows and DOS applications to work together in real-time. They can collaborate on projects, reports or presentations in a true workgroup' setting," explains Richard de Mornay, VP of Marketing for Norton-Lambert. "In classroom scenarios, instructors can broadcast computerized demonstrations to the entire class, while everyone watches comfortably on their own screen."

Workgroup Conferences Cut Company Expenses
Ideal for group decision-making, Close-Up/LAN Pro handles group connections over LANs or WANs, allowing companies to cut travel costs by holding conferences over the network. The program allows users to connect through routers and bridges from 56 Kbits to fiber-optic speeds, bringing people in different cities together. Conference leaders can project proposals, review spreadsheets, agendas, even edit charts and graphs. They can also record the

demonstration for future reference. Close-Up/LAN Pro even supports remote printing in Windows or DOS, allowing notes from a conference or demonstration to print on the Host or Remote printers.


Share Resources to Lower Network Costs, Maximize Time
Close-Up/LAN Pro cuts company costs by giving everyone on the LAN instant access to company computers, printers, fax cards and modems on the network. Users can even access costly equipment sitting idle to run remote jobs. According to Ward Fitch, Technical Support Manager for Norton-Lambert, "With Close-Up/LAN Pro, users can maximize their time by taking advantage of their network's full potential. You can start printing a report upstairs, recalculate a spreadsheet on the Pentium down the hall, then connect to your associate's PC and work together on a project--all without ever leaving your chair."

Close-Up/LAN Pro includes the complete software for both modem and network remote connections and retails from $399 for the basic package (2 user). Add-On packages ranging from $499 (5-User Add-On) to $999 (20-User Add-On) are also available. For more information on Close-Up/LAN Pro or for a review copy, please call (805) 964-6767.

## News: New Close-Up/LAN Pro Announces Long-Awaited Group Connection for Network Windows Users

SANTA BARBARA, CA, August 21, 1995--Norton-Lambert Corp. has shipped new Close-Up/LAN Pro, the first and only network communications software to make *group connections in Windows a reality*. This breakthrough technology lets multiple users share screens and keyboards in Windows across their Novell LAN or WAN, and still retains that same group connection capability in DOS. While other products offer *one-to-one* solutions for Windows, Close-Up/LAN Pro is now the only program that also supports *many-to-one* connections in Windows & DOS, a capability ideal for interaction in workgroups and classrooms. This virtually untapped capability of networks, pioneered by those who make the top-rated remote modem communications software Close-Up, revolutionizes the way we interact and learn.

Finally, a Windows Environment for Workgroups & Classrooms
Now a group of users (or all the users on the LAN) can team-up in Windows for network-wide workgroups and conferencing. One user simply selects from a pull-down menu to initiate connection to an entire group. Then all users can view and control the same Windows and DOS applications running on a "Host" PC. This unique technology gives people the ability to collaborate with power and ease never seen before. As Richard de Mornay, VP of Marketing for Norton-Lambert, explains, "Only with Close-Up/LAN Pro can a group of associates share Windows and DOS applications to work together in real-time. They can collaborate on projects, reports or presentations in a true workgroup' setting."

Cut Costs, Increase Efficiency
Close-Up/LAN Pro's group connection capabilities offer the tools to cut costs and increase efficiency whether broadcasting a presentation, holding a conference, or training new employees. "Close-Up/LAN Pro is great for application training because the instructor can view the screen of any student that's having a problem and demonstrate how to solve that problem to the *entire class*," remarks William Brooks, IC Manager for the Central New York Psychiatric Center and avid Close-Up/LAN Pro user. Close-Up/LAN Pro can even record the entire session for future playback, reference, or training. Or companies can cut travel expenses by holding conferences over their LAN or WAN with Close-Up/LAN Pro. Now separate teams in Hong Kong and Los Angeles can simultaneously work on the same proposal, review the same spreadsheet, or view the same computerized broadcast, only with Close-Up/LAN Pro.

<u>The Complete Remote Solution</u>
Close-Up/LAN Pro includes a special modem version for network Dial-In and Dial-Out capabilities, making it one of the most comprehensive remote communications solutions available. Anyone can dial into their network from home, or from the road via laptop, to access any workstation across their LAN or WAN.

In addition, Close-Up/LAN Pro offers all the popular features of the top-rated Close-Up 6.0 modem remote product including fastest Windows screen refresh, Expert SystemTM self-installation with no modification to sensitive SYS.INI & WIN.INI files, Non-Intrusive TechnologyTM, point & select file transfer, virus checking, Host & Remote printing, and even a script language for automating communications.

Close-Up/LAN Pro retails from $399.00 for the basic package (2 User). Add-On packages ranging from $499.00 (5-User Add-On) to $999.00 (20-User Add-On) are also available. For more information about Close-Up/LAN Pro or other remote communications products, please call (805) 964-6767.

# News: Novell's NetWare¨ Navigatorª 3.01 Spec Sheet



Powerful, fully automated, scalable solution for electronically distributing software and data

NetWare Navigator is a tool for distributing and installing software and data across enterprise-wide networks. Implemented as a set of NetWare Loadable Modules (NLMsª) on NetWare 3ª or NetWare 4ª servers, this powerful software enables you to install business-critical applications, operating systems and data onto multiple servers and workstations easily and effectivelyÑsaving you time and money.
NetWare Navigator complements NovellÕs ManageWiseª, which provides end-to-end management of networks. Now, instead of going from machine to machine, you can install software on every networked computer from a central locationÑin one easy step. The entire process of downloading software and data is fully automated and completely transparent to users.

Enables Cost-Effective, Reliable Software Distribution
NetWare Navigator reduces the cost of software distribution by replacing expensive manual software distribution procedures with automated, electronic distribution from centralized network servers. Software and data are transferred between NetWare servers and then to workstations, providing a distribution and installation method that is efficient and reliable.

By defining a script, you can verify installation conditions (for example, adequate hard disk space), direct file installations (which files to install and how to install them), and configure workstations (by modifying AUTOEXEC.BAT, CONFIG.SYS, .INI and other files). NetWare Navigator supports DOS, Windows* and OS/2* workstations.

Provides Timely Distribution of Corporate Data
Your employees must have the latest data to make knowledgeable decisions in a constantly-changing global economy. NetWare Navigator distributes data automatically, letting you provide timely distribution of information at a low cost.

Gives You Detailed Reports
NetWare Navigator enables you to monitor the entire distribution and installation process right from your console. It provides detailed reports telling you what package was sent, when it was sent, and where it was sent. Package scripts can be designed to handle errors, such as not enough disk space, and to

automatically notify you of success or failure--letting you take appropriate action to achieve your desired goal.

Scalable Solution Enables Easy Upgrades
NetWare Navigator has a scalable architecture, making it an effective solution for networks small to large. It allows you to upgrade easily and cost-effectively as your network grows.

Provides Ideal Solution for Enterprise-Wide Networks
While most software distribution products are workgroup-oriented, NetWare Navigator supports large numbers of target workstationsÑ even on wide area networks (WANs). Software and data need to be transferred just once across the WAN link, dramatically lowering data transmission costs. This makes NetWare Navigator especially valuable for enterprise networks that have large numbers of users in geographically-dispersed locations.

Graphical Administration Console Provides Flexible Distribution
NetWare NavigatorÕs graphical user interface (GUI) makes automated software and data distribution simple, flexible and consistent across the network.

From your administration console, you have the flexibility of using two different distribution methods for clients: push and pull. If a client needs to receive data immediately, the push distribution method is used. Data is transferred to the target workstation or server (regardless of the computer's activity and without the user's knowledge). The pull method stores data on a server until workstations are ready to receive it, typically during off-peak hours.

Centralized, User-Defined Scheduling
NetWare Navigator can schedule tasks to occur automatically on a daily, weekly, or monthly basis. Complex tasks can be scheduled to run at client workstations during the network's off-peak hours and the workstations' unattended hours. Simply leave the workstation powered on (with the scheduler software loaded), and all events will run automatically and unattended.

Because distribution is much quicker and easier, fixes and enhancements can be distributed across the network on a daily basis if necessaryÑgiving users the most up-to-date, reliable software available. The scheduling feature can be used to ensure that critical events, such as virus scans and software backups, aren't forgotten and occur as planned.

Enables Automated, Unattended Data and Software Distribution

NetWare Navigator fully automates the distribution of software and data. From the administration console, the network supervisor creates packages that include the software files, builds a distribution list, schedules distribution, and sends out the information. Packages are sent first to the primary, or distribution, server, then to staging servers for distribution to client workstations. This process ensures timely and efficient distribution.

Client workstations receive the software packages, execute package scripts to install the software, configure the software using recorded keystrokes, and send feedback to the administration console automatically--all without user intervention. Although the distribution process is unattended, it is secure.

Hardware and software Requirements
Network servers
    Intel386*, Intel486*, or Pentium* microprocessor-based PC; NetWare3.12 or 4.1

Distribution server
    Hard disk with 16MB free disk space
    Minimum 8MB RAM; 16MB RAM recommended

Staging servers
    Hard disk with 9MB free disk space
    Minimum 8MB RAM; 16MB RAM recommended

Client workstations
    NetWare Client 1.2
    DOS/Windows
    Hard disk with 200KB free disk space
    DR DOS¨ 6.0, Novell DOS 7, or
    MS-DOS 5.0 or higher; Windows 3.1 (enhanced mode) OS/2
    OS/2 2.1 or higher
    Hard disk with 1.2MB free disk space

Administration console workstation
    Windows 3.1 (enhanced mode)
    Hard disk with .5MB free disk space
    8MB RAM

Novell, NetWare and DR DOS are registered trademarks; and ManageWise, NetWare 3,

NetWare 4, NetWare Client, NetWare Loadable Module, NetWare Navigator and Novell DOS are trademarks of Novell, Inc. Intel386,

Intel486 and Pentium are trademarks of Intel Corporation. OS/2 is a registered trademark of International Business Machines Corporation.

MS-DOS and Windows are registered trademarks of Microsoft Corporation.

For more information
Contact your local Novell Authorized Reseller or system house, or call Novell at:
1-800-NETWARE (638-9273)
1-801-429-5533
FAX: 1-801-429-5155
or write:
    Novell, Inc.
    2180 Fortune Drive
    San Jose, CA 95131

## News: The LAN Support Group, Inc. Announces BindView for NetWare Directory Services



Houston, August 21, 1995--The LAN Support Group, Inc. (LSG) extends the capabilities of BindView NCS, the award winning network management software for NetWare 2.x/3.x LAN's, to NetWare 4.x with BindView for NetWare Directory Services (NDS). BindView for NDS provides detailed reporting on NetWare 4.x servers and the entire NDS tree.


BindView's Powerful Report Generator Is Now Native NDS
With the Report Generator for BindView for NDS, you have a seamlessly integrated analysis and reporting tool for your 4.x LAN. The reporting engine allows network administrators to browse the NDS database and all objects visible on the NDS tree; information regarding server configuration and server settings may also be accessed on licensed servers. All the powerful reporting and analysis capabilities of BindView are now available for NetWare 4.x and NetWare Directory Services..

With the report generator, network administrators are given the option of running BindView for NDS's pre-defined reports or creating customized reports by using the available sorting and filtering options. All reports generated are of presentation quality and may be printed, exported or even sent through e-mail.

Create Baseline Reports to Help Track and Monitor Changes in Your File Servers
Baseline reporting is also a function of the report generator for BindView for NDS. With baseline reporting, any report created may be designated and stored as a baseline against which future reports can be compared. Running reports against a baseline gives the network administrator a clear idea of what has changed since the last report was run, facilitating the monitoring and maintenance of his or her network.

"The Report Generator for BindView NDS is both flexible and easy to use." says Eric Pulaski, president of The LAN Support Group. "While our pre-defined reports are extensive, the user still has the flexibility to sort and filter information to create his or her own reports if the need arises. Reports can also be stored as baselines, giving network administrators a running history of the status of their NetWare 4.x LAN's."


Security Audits and File Server Documentation Is Possible with BindView for NDS's Server Reporting
BindView for NDS provides access to extensive NetWare 4.x server configuration information. File server documentation capabilities include, but are not limited to, NDS partition information, volume details, server set variable information, disk

space analysis, NLM management, and accounting information. The retrieval of file server error log information and file server configuration files including STARTUP.NCF and AUTOEXEC.NCF.is also possible.

Security audits can also be performed with BindView for NDS. Through the file server information module, a complete data security analysis may be performed. By specifying a particular directory or file, the network administrator can access information regarding exactly which users have rights to network resources and how those rights were inherited. This allows network administrators to monitor and control user rights and access to network resources.

"Every network administrator needs to know who has access to what in order to keep the network secure and running," said Eric Pulaski. "BindView for NDS gives the network administrator access to all the security information needed to perform his or her policing job effectively."

BindView for NDS Provides Object Reporting
NDS object properties and information may be analyzed and reported on with BindView for NDS. NDS objects include user accounts, groups, organizational roles, aliases, template users, printer queues, printers, container objects, and anything else defined as an object in the NDS tree. NDS object reporting allows the sorting and filtering of user and object information to create reports that are customized to a network administrator's specific needs. The network administrator can report on any properties associated with an object on the NDS tree, including disk space in use, disk space available, security restrictions, security equivalencies, group membership, location in the NDS tree, rights that the object has, and any other properties associated with the object.

Object licenses broaden the base of security information provided by the server licenses. With object licenses the network administrator can expand his or her reporting capabilities by allowing a thorough analysis of a specific object's security equivalencies, trustee assignments and other security information. Information regarding a user's effective rights including rights to any directory, file or NDS object and how those rights were inherited is also accessible. BindView for NDS will also locate hidden objects; invisible even to the Admin account, hidden objects can be used as back doors into the network and can pose security problems if not detected.

"BindView for NDS gives the network administrator a comprehensive tool kit for administering and securing the network," said Eric Pulaski. "The more you know about your NDS tree the more effectively you can spot present or potential problems and solve or avoid them."

Pricing and Availability
BindView for NDS will be available at the end of this month. Pricing and availability is to be announced.

The LAN Support Group is a leading provider of LAN management products. This privately held company is located at 2425 Fountainview, Suite 390, Houston, Texas 77057. The company can be reached at (800) 749-8439.

## News: The LAN Support Group Introduces The BindView Associates Program for Resellers and Consultants



Houston, June 16, 1995-- The LAN Support Group, Inc. (LSG), makers of BindView NCS, has instituted The BindView Associates Program, a reseller program which provides members with the complete LSG product line, increased discounts on products for resale, and BindView's LAN Documentation Tool Kit, a tool for increasing service revenue. Access to beta versions of new products and early release information is also a major part of membership.

"This program offers qualified resellers an opportunity to join in a partnership with a growing company," said Eric Pulaski, president of The LAN Support Group. "They can combine their expertise and our superior LAN management tools to successfully maximize their position in the market."

Service Revenue Generation
The BindView Associates Program provides members with BindView's LAN Documentation Tool Kit, the consultant's version of LSG'S award winning LAN management software, BindView NCS. The reseller can travel from site to site providing extensive security audits, disk space analysis, and LAN documentation for their clients.

"Reseller's are in a unique position to provide the LAN auditing and documentation services there clients need. Our tools facilitate this by providing maximum flexibility and functionality for the reseller to generate these valuable services," said Eric Pulaski.

Pricing and Terms of Agreement
The BindView Associates program is designed to support systems integrators, value added resellers, and consultants focused on network management products and issues. Qualified members have a successful history of network integration and management, with a focus on Novell technologies.

Joining the BindView Associates program requires the submission of a straightforward application and the program fee of $495. The LAN Support Group then provides the NFR software (approximate retail value of $5800), service revenue software and a complete marketing kit.
The LAN Support Group is a leading provider of LAN management products. The privately held company is located at 2425 Fountainview, Suite 390, Houston, Texas 77057. The company can be reached at (800) 749-8439.

## News: LAN Support Group Announces Technology That Intelligently Manages Workstation Auditing Across LANs and WANs



HOUSTON, June 19, 1995--The LAN Support Group, Inc. (LSG), developers of the BindView® Network Control System (BindView NCS), today announced the Enterprise Workstation Auditing Module (EWAM), which begins shipping next month. With this new product, LSG solves the most pervasive problem facing the administration of hardware and software inventory: the management and reporting of workstation hardware and software across multiple file servers, LANs, and WANs.

Single Server Workstation Auditing Is Yesterday's Technology
The EWAM extends LSG's award-winning Workstation Auditing Module (WAM) to operate seamlessly in networks containing any number of workstations, servers, networks, and WANs.. "The need to report and centrally manage PCs across multiple file servers is a problem faced by companies large and small," said Eric Pulaski, president of LSG. "As is typical in our industry, the solutions provided in the past are no longer sufficient today. We've reached a point in the development cycle of hardware and software inventory where we must move beyond the simple functionality of collecting and reporting workstation information into a single database on a single server. The EWAM architecture, developed over a two-year period in collaboration with some of the LAN Support Group's largest customers, is a flexible, feature-packed system of state-of-the-art management technology. It is the next step for workstation auditing packages.

An Intelligent Infrastructure for Workstation Auditing and Reporting
. . The EWAM is an intelligent flexible infrastructure, highly automated so that the administrator can use as many or as few of the features and options provided. Duplicate-node headaches are a thing of the past, as is the universally unpopular concept of auditing nodes across slow WAN links. The EWAM is so advanced it even comes with its own Technical Adviser, which in the space of a few moments can analyze the EWAM configuration and that of the network and point out exceptions or offer suggestions.

The EWAM provides enterprise-wide reporting. With a few keystrokes, an administrator can see any information about any nodes in the enterprise. The EWAM knows where each node's audit information is located, and accesses that information transparently, as though it were one big database. Every node in the EWAM is automatically assigned a "home" Audit Server according to simple rules

defined by the administrator. As the node logs in, it will always be routed to the appropriate "home" Audit Server. In addition, moving a node from one Audit Server to another takes just a few keystrokes.

Efficient, Centralized Administration Through Database Synchronization .
The EWAM centralizes and unifies administration. The entire system, encompassing an unlimited number of servers and workstations, can be controlled and configured from a   single workstation. When the administrator makes a change to the system (e.g., changing the custom audit interval or adding a software package to the custom software list), an NLM, running in the background, propogates those changes to all other servers. With this NLM, the administrator is not required to login to each server one-by-one to make those changes manually. !

In addition to its own intelligent management tools, the EWAM hosts a variety of useful network management utilities including basic server-to-server file distribution and file management.

.
Pricing and Availability
The EWAM runs on Novell NetWare 3.x and 4.x file servers (4.x requires bindery emulation). NetWare 2.x servers are supported in conjunction with at least one 3.x server..   Pricing starts at $895 for a 100-node license.

The LAN Support Group is an award-winning provider of cutting-edge LAN management products. The privately held company is located at 2425 FountainView, Suite 390, Houston, Texas 77057. They can be reached in Houston at (800) 749-8439, or via their international office in London, England, at +44 1322.289900.

## News: LAN Support Group Ships Snap-in Workstation Hardware and Software Inventory Module for HP OpenView® for Windows.

Houston, May 29, 1995--The LAN Support Group, Inc. (LSG), maker's of the BindView® Network Control System (BindView NCS), announced the BindView Workstation Manager for HP OpenView, which begins shipping this week. With this new product, BindView NCS broadens its workstation auditing/inventory product to include the HP OpenView platform.

Committed To Providing True Integration To Major Network Management Platforms
"We've made a commitment to our end-users to support the leading network management platforms with comprehensive integration to our existing products," says Eric Pulaski, President of The LAN Support Group, Inc. HP OpenView integration has now been added to our existing integration into Novell's Network Management System (NMS). We want to provide a level of flexibility unparalleled in this industry so that the Network Manager has choices instead of limitations."

The BindView Workstation Manager for HP OpenView provides 24 icons and dialog pages of detailed configuration information, hardware and software inventory, and management of configuration files (such as autoexec.bat and config.sys) from within the HP OpenView Console. The BindView Workstation Manager for HP OpenView works in conjunction with LSG's award winning Workstation Auditing Module (WAM).

The BindView NCS Workstation Auditing Module (WAM) provides a complete configuration analysis, revision history of configuration files, remote updating, hardware and software inventory, asset management, alerts, as well as an unlimited node history about both DOS and OS/2 workstations.

Docking Station Support
The BindView Workstation Manager for HP OpenView also supports multiple notebooks sharing the same docking station, a scenario not normally supported by the HP OpenView platform which identifies nodes strictly by network address. With the BindView Workstation Manager, when a user selects a docking station from the HP OpenView node map, a list of all notebooks sharing the docking station is displayed. This added functionality gives the user the option of accessing any of the notebooks that share the docking station. Without this functionality, HP OpenView would see the docking station and all notebooks using that station as the same node.

Using the BindView Workstation Manager for HP OpenView, a systems administrator can now retrieve the WAM's in-depth workstation information at the click of a button. The BindView Workstation Manager for HP OpenView is also a useful tool when managing more than one WAM database. If multiple file servers are used with the BindView NCS WAM, the Workstation Manager will search all WAM databases for information about the selected node.

In addition to the dialog pages, the BindView Workstation Manager for HP OpenView comes with a separate System Information Update Utility that synchronizes the HP OpenView node database with the BindView NCS WAM database. The System Information Update Utility automatically replaces the node address with the Node Name for that workstation from the BindView WAM. This results in a more meaningful node name than simply using the node address.


Pricing and Availability
The BindView Workstation Manager for HP OpenView will begin shipping on May 29, 1995 and is priced, for a limited time, at $495.00 per HP OpenView console. The BindView NCS Workstation Auditing Module (WAM) is priced at $595.00 in one hundred node increments and requires at least one BindView NCS Console priced at $200 per internetwork.

The LAN Support Group, Inc. is a leading provider of LAN Management products. The privately held company is located at 2425 FountainView, Suite 390, Houston, Texas 77057. The company can be reached at (800) 749-8439. The company also has an international support office in London, England, +44 1322.289900.

## News: LAN Support Group Ships First True Snap-in Workstation Hardware and Software Inventory Module for Novell's NMS

Houston, February 1, 1995--The LAN Support Group, Inc., makers of the BindView Network Control System (BindView NCS), announced the BindView Workstation Manager for NMS. With this new product, BindView NCS becomes the first workstation auditing/inventory product to provide a true snap-in module using the native GUI interface of Novell's NetWare Management System (NMS).

The BindView Network Manager for NMS Provides Tight Integration
"The promise of NMS was to create a graphical user interface that could serve as a common platform for network management applications from different vendors," says Eric Pulaski, President of The LAN Support Group. "The native GUI interface of NMS, the "dialog book" that appears when you double-click on a node, allows developers to create snap-in DLL's that actually extend this native user interface by adding new icons and dialog pages. Until now, however, other vendors of workstation auditing and inventory products have simply used NMS as a launching point for their own management consoles. We are the first workstation auditing product to provide snap-in DLL's for NMS's native GUI user interface."

The BindView Workstation Manager for NMS adds 24 icons and dialog pages into the NMS dialog book, providing detailed configuration information, hardware and software inventory, and management of configuration files (such as autoexec.bat and config.sys) from within the NMS Console. This gives users access to workstation auditing and inventory information from within the NMS Console itself, without having to launch other programs or Alt-Tab between different applications. The BindView Workstation Manager for NMS works in conjunction with LSG's award winning Workstation Auditing Module (WAM).

The BindView NCS Workstation Auditing Module (WAM) provides a complete configuration analysis, revision history of configuration files, remote updating, hardware and software inventory, asset management, alerts, as well as an unlimited node history about both DOS and OS/2 workstations.

Using the BindView Workstation Manager for NMS, a systems administrator can now retrieve the WAM's in-depth workstation information at the click of a button. The BindView Workstation Manager for NMS is, also, a useful tool when managing more than one WAM database. If multiple file servers are used with the BindView NCS WAM, the Workstation Manager will search all WAM databases for information about the selected node.

In addition to the snap-in DLL, the BindView Workstation Manager for NMS comes with a separate System Information Update Utility that synchronizes the NMS node database with the BindView NCS WAM database. The System Information Update Utility automatically updates the NMS node database with information from BindView's Workstation Auditing Module (WAM) database. This includes updating each workstation's System Name on the NMS map with the Node Name for that workstation from the BindView WAM. It, also, automatically updates the workstation's operating system type, RAM size, display model, CPU type, and network adapter type.

Availability
The BindView NCS Workstation Manager for NMS began shipping on February 1, 1995. It requires v3.5 of the Console and v2.0 of the WAM.

The LAN Support Group, Inc. is a leading provider of LAN Management products. The privately held company is located at 2425 Fountainview, Suite 390, Houston, Texas 77057. The company can be reached at +1 713 789-0882. The company also has an international support office in London, England, +44 1322-289900.

## News: LAN Support Group Announces a Network Operating System Independent Workstation Auditor



Houston, July 17, 1995--The LAN Support Group, Inc. (LSG), developers of BindView Network Control Systems (BindView NCS), announced the BindView Workstation Auditor for DOS-Based Networks, which will begin shipping immediately. With this product, LSG extends the capabilities of its Workstation Auditing Module to all leading network operating systems.

No Longer Just for NetWare
The Workstation Auditor for DOS-Based Networks supports Banyan System's VINES, Microsoft's LAN Manager, IBM's LAN Server, Microsoft's NT Server, and other DOS based networks. The BindView Workstation Auditor for DOS-Based Networks offers network administrators all of the benefits of LSG's award-winning Workstation Auditing Module. It gathers information about all attached and stand alone DOS based PC's, and provides flexible customizable reporting, a complete configuration analysis, revision history of configuration files, remote updating, hardware and software inventory, comprehensive asset and inventory tracking, asset management, user-defined prioritized alerts, three way node identification, as well as an unlimited node history.

"We were consistently asked why we supported only Novell Networks," said Eric Pulaski, president of The LAN Support Group. "This kind of interest proves that every network needs a uniquely powerful asset management tool like the BindView Workstation Auditing Module (WAM). There is no other asset management utility that can do everything it does. We have filled the gap with the Workstation Auditor, a product that has all of the capabilities of the our Novell-based Workstation Auditing product with the flexibility to work on all popular DOS-based networks."

Pricing and Availability
The BindView Workstation Auditor for DOS-Based Networks is available now. The Workstation Auditor Console and 25 Node License is priced at $690.00. The Workstation Auditor Console and 100 Node License is priced at $1,090 per 100 node license.

The LAN Support Group is an award-winning developer of LAN management products. The privately held company is located at 2425 Fountainview, Suite 390, Houston, Texas 77057. They can be reached in Houston at (800) 749-8439, or at their international office in London, England at +44 1322.289900.

## News: The LAN Support Group Ships First Compression NLM for NetWare 3.x



HOUSTON, June 5, 1995--The LAN Support Group, Inc. (LSG), developers of BindView NCS, will begin shipping this week a product that provides real-time, transparent file compression services for NetWare® 3.x servers. NetSqueeze™ is the first product to provide file compression services for NetWare file servers as an NLM-only solution, requiring no workstation Terminate-and-Stay-Resident (TSR) programs.

"A product like this is exactly what every NetWare LAN needs: an extremely easy and cost efficient way to add more available disk space," said Eric Pulaski, LSG's president. "And since it's been developed by the same folks that made BindView you know you can rely on the quality of the product."

NetSqueeze Increases File Server Disk Space
NetSqueeze for NetWare 3.x is the only product that allows users to transparently compress and decompress files. In addition, NetSqueeze increases the manageability of network storage. It generally reclaims between 60-80% of the disk space used by data files and approximately 50 percent for EXE, COM, and overlay files. This provides administrators with more storage capacity using existing equipment.

"The two biggest problems on our file servers are security and disk space management. Since Citibank already uses LSG's security products as a corporate standard, I've been anxiously awaiting NetSqueeze's disk space management solution," says Stosh Jarocki, a director of corporate audit at Citibank. "With hundreds of file servers, the impact that disk space management can have for us at Citibank is huge. I've been using this product since it's first beta in August of 1994, this is the real time disk space management solution I need."

Compression Is Totally Configurable
"As a NetWire SysOp and network management consultant, I have seen hundreds of network management and related utilities," says Peter Kuo, Ph.D. "I'm really excited about the solutions this product provides. It's a full featured answer to a pervasive problem."

NetSqueeze uses a combination of global rules and command-line utilities to set compression specifications. Global rules can be used by the System Administrator to automatically compress all files/directories matching his or her

specifications. For example, the system administrator may wish to compress all files named line "*.DOC", "*.BAK", *.OLD", or all files in directories named like "BACKUP*." Since the file sizes are reduced, this can dramatically decrease tape backup time. Command-line utilities allow the administrator or a user to flag individual files and directories for compression.


Your Data is 100% Safe

NetSqueeze uses an NLM that provides compression services on a file-by-file basis. This approach avoids problems associated with using a device driver or TSR that compresses an entire disk partition to a single "disk image" file. In addition to the memory overhead involved, the device driver/TSR approach creates a high level of risk. A problem or error anywhere on the disk can wipe out large areas of data, or even the entire disk. With the NetSqueeze NLM, there is no memory overhead at the workstation and the NetWare operating system protects the files from corruption due to workstation lockups or power surges. Even a physical write error at the server, which might normally damage a single file, would still only effect the single file with NetSqueeze loaded--not any other files on the server. Thus, NetSqueeze eliminates the risk usually associated with most other real-time, transparent compression products.


Fast File Compression

NetSqueeze uses the core *Stacker LZS™* compression technology, licensed by The LAN Support Group, Inc. The *Stacker LZS* compression technology is a high performance, lossless data compression engine. *Stacker LZS* compression increases the storage capacity of disk drives by shrinking, or compressing, the data to be stored. With multiple levels of data compression and speed performance tuning, *Stacker LZS* provides some of the industry's fastest data compression, yielding, on average, a better than 2-to 1 compression ratio.


Pricing and Availability

Users can purchase NetSqueeze as a standalone products, or as an integrated part of the BindView NCS product family for users of the BindView NCS Management Console v3.5. Introductory pricing is $595.00 per file server, however, a discount will be offered initially for a limited time upon release.

LSG is a leading provider of LAN management products. The privately held company is located at 2425 FountainView, Suite 390, Houston, Texas 77057. The company can be reached at (800) 749-8439. The company also has an international support office in London, England +44 1322.289900.


Stac Electronics, of Carlsbad, California, is a leading supplier of high performance data compression products for personal computers. Implemented in

software and silicon, Stac's products are sold direct from the company and through retail and OEM sales distribution channels worldwide.

# News: Frye Launches Windows-Based Client-Server Solution for Inventory Management



*LAN Directory for Windows Streamlines Hardware and Software Inventory Across the Enterprise*

June 9, 1995 Boston, MA --Frye Computer Systems, Inc. (FCS), A Seagate Software Company, today announces The Frye Network Management Platform-- LAN Directory™ for Windows® V1.0 (WinLAND). WinLAND enables network managers to inventory more than 300 hardware items, automatically identify software on each PC workstation and expand upon its user-definable software master list of more than 6,000 files. Its extensive selection capabilities provide network managers with the ability to customize the information collected and viewed in order to track and observe the information specific to the users' needs. WinLAND's flexibility lets network managers input administrative data, such as asset tags and serial numbers for a comprehensive database of critical items located on each networked PC.

According to Russell H. Frye, president of Frye Computer Systems Inc., A Seagate Software Company, "WinLAND is the latest in our rapidly expanding lineup of MS Windowsbased network management products. Along with many other products to be announced this year, we are providing support for Windows 3x, Microsoft Windows 95, Windows NT, Novell NMS and much more."

Automatic Hardware And Software Inventory and File Collection
WinLAND automatically identifies hardware and software at each workstation and collects specific .BAT, .INI, .CFG and .SYS files across the network. Network managers can locate any text file, using a range of specific parameters such as minimum and maximum size, date and linked files, etc., with no upper limit of collected file sizes.

Powerful Display, Sorting and Filtering Options
With WinLAND, network managers can customize and display as much or as little data as desired, sort on hundreds of fields and set criteria to filter and display only specific information. Because it is a Windows-based solution, WinLAND lets network managers cut, copy and paste customized information to any Windows application for decision support, cost analysis and future planning.

Custom Report Writer

Network managers can employ WinLAND's powerful report writer to organize data by selecting fields to search from and sort by defining report criteria based on the collected data, for an unlimited number of combinations. Output can be directed to a monitor, ASCII file or printer. More than 40 standard reports, such as the WIN 95 Incompatibility Report, are also included.

ODBC Support
WinLAND utilizes ODBC level 2 support and ships with the Watcom database, which lets users access it from a 3rd party program, thus experiencing the benefits of ODBC compliancy.

Brandon Savage, LAN Administrator at New England Research Institute says, "Logging data was once very time-consuming. However with WinLAND, the speed to cluster the information is very fast. Its Windows interface is very comprehensive, making the product very easy to use. I have quick access to all statistics and configuration information. We intend to purchase WinLAND and utilize its capabilities daily to proactively manage our existing LANs and future installations."

Client-Server Design
Client-server's inherent scalable design and its enterprise-management features allow for deployment from the desktop to the datacenter. WinLAND's client-server implementation lets network managers collect key details for each network operating system including overview information such as shell and LSL versions, network parameters and TCP/IP vendor, version and address information.

Additional WinLAND Features
WinLAND provides efficient and quick inventory and software collection, full Windows support, such as GUI Interface, toolbars, etc., and cutting and pasting information from any screen or collected file into a Windows application. Its flexible scheduling feature lets managers separate hardware, software and file collection on a per user basis, reducing the time it takes to gather information and the frequency of the collection. No TSRs are necessary.

Platform Support
WinLAND supports Windows and Windows NT desktop operating systems and other major network operating systems such as: Microsoft Windows NT, Microsoft Windows for Workgroups, Novell NetWare and Banyan VINES, among others.

Compaq Partnership
On March 8, 1995, Frye Computer Systems announced an alliance with Compaq

Computer Corporation to ensure enhanced compatibility between Compaq PCs and Frye's products by leveraging Compaq's Intelligent Manageability strategy. WinLAND provides network managers with the ability to catalog specific elements, such as asset tag, ROM revision date, system board revision date and the make, model and serial number for the system, monitor and hard drive of Deskpro PCs and Performance Monitors in order to accurately identify, inventory and report on critical LAN components.

### Pricing and Availability
The Frye Network Management Platform --LAN Directory for Windows V1.0 (WinLAND) will soon be available from resellers and distributors such as Ingram Micro, Tech Data and GBC/Vitek. WinLAND's suggested retail price is $595 for the Initial License (up to 50 computers) and $495 for each Additional License (for each additional 100 computers). A single console license, which allows the user to install a WinLAND console on an additional workstation, is available at a suggested retail price of $149 which includes a $50 Watcom licensing fee.

### WinLAND Requirements
WinLAND requires Microsoft Windows 3.1 or higher and 8 MB of RAM.

### About Frye Computer Systems, Inc.
Founded in 1988, Frye Computer Systems, Inc., A Seagate Software Company, is the leading developer of network management tools for Novell NetWare LANs and WANs as well as other major network operating systems. Available through a network of national and international distributors, VARs and integrators worldwide, The Frye Utilities for Networks currently includes NetWare Management, NetWare Early Warning System, LAN Directory, NetWare Console Commander, Node Tracker, Software Update and Distribution System, SUDS Wide Area Network Distribution Module, SUDS Wide Area Server Update Program, Alert Interface Manager for NMS and Software Metering And Resource Tracking. The Frye Network Management Platform currently includes Statistics Display Rack for NetWare, Software Update and Distribution System for Macintosh and LAN Directory for Windows.

All of The Frye Utilities for Networks and The Frye Network Management Platform products are trademarks of Frye Computer Systems, Inc. A Seagate Software Company and all other products mentioned in this press release are trademarks of their respective companies. Windows is a registered trademark of Microsoft Corporation.

# News: ON Technology Ships First NetWare® Auditing Product With Windows Interface

*AuditTrack v2 features a Windows console and enhanced reporting options*

April 7, 1995--Cambridge, MA--In response to customer demand, ON Technology announced today that AuditTrack v2, a NetWare network auditing product, is now shipping with a new Windows interface and expanded reporting capabilities including color-coded reports and customized graphing. AuditTrack is a powerful network surveillance system that allows LAN administrators to track and identify all login, file, remote access and bindery activity occurring anywhere on a NetWare network. AuditTrack is the leading server auditing package for NetWare networks and was first introduced in September of 1994.

"Once our users saw the wealth of valuable information AuditTrack provided about their networks, they loved it;" said Chris Risley, CEO, ON Technology, "however, we kept hearing the request for a Windows interface over and over. We are pleased to provide our users with the Windows console in AuditTrack v2. By leveraging the inherent capabilities of the Windows environment, the system becomes much easier and quicker to use. No other network auditing product has anything like it."

The new Windows console in AuditTrack v2 allows for management of the system and reporting and graphing to be performed at the client level from any Windows workstation and fully leverages the features of the Windows environment such as mouse support and toolbars. Previously, system functions had to be performed at the server or through a NetWare utility called RConsole. Because the administrator can now port information from any server running AuditTrack to any Windows workstation, all of the information which AuditTrack provides becomes more easily accessible and any drain on the server's resources is alleviated.

AuditTrack v2 provides a complete view of the network in real-time and is supported by a wide variety of customizable reports that capture all server and file access activity. The new customized graphing capabilities allow users to graph any data that has been tracked in an audit set. With AuditTrack v2 reports and graphs are color-coded for quick analysis and visual impact.

"The new reports and graphs in AuditTrack v2 are a bonus, but the Windows interface is the time saver," said Mike Goddard, Assistant Vice President and Senior Systems Analyst for PNC Mortgage Corp. of America in Pittsburgh, PA. "Our WAN consists of almost 50 file servers with a technical support team located around the country. I use AuditTrack to easily track and monitor the

activities of these remote administrators. The information and control it provides are indispensable."

The new release also includes other features to increase the ease of use. For example, AuditTrack now allows administrators to group servers into categories which saves time when looking for a specific server to audit or when auditing multiple servers. This version also includes the ability to assign multiple auditors to the system. Each auditor can be assigned various levels of rights by the Master Auditor.

AuditTrack v2 builds upon NetWare's inherent security system to provide administrators with eight predefined, automatic audit sets including groups, individuals, gateways, print queues, failed logins, and intruder detections. AuditTrack v2 audits DOS, Windows, Windows NT, Macintosh, UNIX and 0S/2 files on any NetWare 3.x, 4.0x, or 4.1x server. It offers such sophisticated surveillance features as broadcast notifications which alert the administrator if access is attempted on a selected file or directory and global filters which allow an administrator to monitor a specific workstation or segments for successful or failed events.

Because it is a NetWare Loadable Module (NLM), AuditTrack v2 is easily installed and monitors activity across a network from a central server. Unlike most other auditing products, AuditTrack requires no terminate-and stay-resident (TSR) program on user workstations and is completely transparent to users.

AuditTrack V2 is available immediately and exclusively from ON Technology Corporation. A 250-user pack sells for $1,295, a 100-user Pack is $895, and a 50-user pack is $495. The product is part of ON Technology's pioneering "Try Before You Buy" program which allows customers to evaluate the product on the LAN for 30 days--free of charge. Contact ON Technology at (800) 767-6683 to order AuditTrack or for information about any of ON Technology's other networking products.

ON Technology Corporation is the leading provider of networking products that connect and manage DOS, Macintosh, UNIX and Windows workstations on Novell NetWare networks. Among other products, ON Technology offers Meeting Maker XP, DaVinci eMAIL, Notework E-Mail, The Coordinator, SofTrack, and MHS gateways. Headquartered in Cambridge, Massachusetts, ON Technology now has more than 2.5 million users world wide.

# News: On Technology's AuditTrack v2 Partial Beta User List

Judy Green
Forum Corporationi
America
Boston, MA
617-973-2096

Mike Goddard
PNC Mortgage Corp of

Bethel Park, PA
412-831-5580

Wayne Benner
V.A.W. of America
Electronics
Phoenix, AZ
602-269-2488

Doug Miller
Westinghouse Security

Santa Clara, CA
408-727-6521 x3746

Tim Crothers
Home Insurance
Grand Rapids, MI
616-940-9402

## News: ON Technology Introduces Workgroup Collaboration Product For Windows and Macintosh Environments



April 28, 1995, Cambridge, Mass.--ON Technology announced today that Common Knowledge, a collaborative groupware product for sharing information and documents, is now shipping. Common Knowledge is an easy to use, interactive software package that allows users to create, access, edit, distribute, and share information over a network while providing a structure for managing and tracking the input of workgroup participants.

Common Knowledge offers an interactive groupware environment that can be utilized to perform a wide variety of practical business functions from project management and collaborative writing to time and resource management, bulletin board services to information archiving.

The product was first introduced in 1991 under the name of "Instant Update" for Macintosh networks only. In addition to the name change, the software has been re-engineered and now supports both Windows and Macintosh environments as well as IPX and Net BIOS in addition to Appletalk.. The product will be now known as Common Knowledge; the current release is Version 2.5.

"The collaborative nature of Common Knowledge enables us to hold virtual meetings where you can thrash out ideas," said one of the beta program participants, Dave Edwards, president of Aurora Microsystems in Aurora, Ontario. "With Common Knowledge, we all don't have to sit in one room to jointly work on a project. It doesn't matter whether you do the work at 2 p.m. or 2 a.m., Common Knowledge provides you with an audit trail of who said what and when," Edwards said of the new release.

"Instant Update developed an extremely loyal following with the Macintosh community;" said John Rizzi, Vice President of Sales for ON Technology, "but it was a niche product ahead of its time. With the growing need for workgroup collaboration products, we saw an opportunity to broaden the product's appeal in the Windows market. After re-engineering the software, adding cross-platform support and enhancing the package with new features, we now offer Windows and Macintosh users a powerful, instant workgroup collaboration tool."

Workgroup CollaborationBased on Client/Server Model
Common Knowledge is based on a client/server database model that allows users to create and modify information locally while updating to and from a server. Unlike many similar products, Common Knowledge includes its own proprietary transport to independently distribute information across the network

and does not require any electronic mail package on which to run. In fact, Common Knowledge can provide basic discussion capabilities and collaborative information sharing capabilities for those users who do not have or do not desire a full-blown e-mail package.

In addition to Windows support, Common Knowledge includes other new features to increase its ease-of-use and functionality such as write protection for blocks of information (paragraph locking), multiple undo/redo levels, enhanced formatting options, and page breaks.

With Common Knowledge, users can create files internally or import them in ASCII or Rich Text File (RTF) format.

Once a user has prepared information for distribution in Common Knowledge, they select from a public or private list of users who are to participate in the collaboration process and receive the information. By clicking the "Update" button, the user sends the information to the server. Each workgroup participant then receives and can modify the information without affecting any other user's version until both "update" again.

Common Knowledge includes a notification feature that can alert all members of the workgroup, either visually or audibly, when changes are made to a master file so users can be sure they are viewing and working on the most current version. A notification feature flags each change made to a file and notes who made the change as well as when. Users can quickly skim through the changes, jumping from one to the next, or perform a search based on who made the changes.

"We have found the new lock text' feature and cross-platform functionality particularly useful," said Edwards of his experience with Common Knowledge in the beta program.

Common Knowledge also includes an easy way to resolve conflicts, which occur when more than one user updates the same information in a file simultaneously. If a conflict occurs, Common Knowledge allows users to cycle between different versions of the file and incorporate all versions or resolve the conflict in favor of one version.

Common Knowledge is as easy to use as a word processor, and even resembles one. The package includes all of the standard document creation features such as cut\copy\paste, TrueType Font Support, headers and footers, tables support, template creation, and varying undo\redo levels. Common Knowledge also provides more powerful collaborative features such as folders, notifications, paragraph locking, and activity logs. Files are listed in the Document Access window and marked with an in\out arrow indicating whether changes are incoming from other participants or outgoing from the local user.

"Common Knowledge is much more powerful than word processing, electronic mail, or any other singular communications packages. It brings together the features and qualities of many familiar desktop applications and makes them readily available on a network so that multiple people have access to and can modify information," said Rizzi.

Like other aspects of the product, installation and maintenance of Common Knowledge is very simple and streamlined. The product runs on Windows v3.1 or higher and Macintosh System 6 or higher, and supports IPX (3.1 or greater), NetBIOS and Appletalk. On small networks (20 users or less) the software can be installed on a Macintosh or PC server running other applications. For larger networks, a dedicated server is recommended.

After installing a system extension on the server and on each networked workstation, the administrator creates and maintains workgroups and user accounts including passwords.

In North America, Common Knowledge is available immediately from ON Technology in 10-user or 50-user increments starting at $79 per user. Outside North America, availability and pricing are determined on a country-by-country basis by ON Technology's worldwide network of distributors and resellers.

The product is available for free evaluation, as are all ON Technology products, through the company's "Try Before You Buy" program, which provides fully-functional software to users for 30 days without obligation. To purchase Common Knowledge, order trial software, or receive information about any of ON Technology's offerings, please call ON Technology Corporation at 1-800-767-6683.

ON Technology Corporation is a privately held company that specializes in workgroup software for Windows, DOS, and Macintosh networks. Among other products, ON Technology offers Meeting Maker XP, DaVinci eMAIL, Notework E-Mail, The Coordinator, Audit Track, SofTrack and MHS gateways. Headquartered in Cambridge, Massachusetts, ON Technology now has more than 2.5 million users world wide, and is the leading provider of MHS products in the world.

## News: ON Technology's DaVinci eMAIL Moves Ahead With Addition of NDS Integration and Client/Server Technology



Cambridge, Mass., July 14, 1995--ON Technology Corporation today announced a new version of DaVinci eMAIL that capitalizes on Novell's NetWare Directory Services (NDS) architecture and new client/server technology to significantly improve e-mail administration and usage--and earn another "industry-first" designation for DaVinci eMAIL.

The new version, DaVinci eMAIL 3.2, builds on the market leadership position that DaVinci has established as the world's leading NetWare MHS-based electronic mail application for DOS, Windows and Macintosh environments.

While previous versions of DaVinci eMAIL have supported aspects of NDS and NetWare 4.1, the new version includes native integration for Novell's robust MHS Services transport--the first e-mail package to have such support. At this higher level of integration, DaVinci eMAIL uses NDS to automatically maintain an enterprisewide address book, essentially eliminating the time-intensive methods required for manual address synchronization.

"For DaVinci it's another industry-first, but the real beneficiaries are network administrators and end-users," said John Rizzi, Vice President of Sales at ON Technology and one of the e-mail industry's leading technology and end-user advocates. "With native support for NDS and MHS Services as well as the new client/server model, administrators will find e-mail a snap to manage on any size network and users will find their address book automatically includes everyone in the enterprise, without limitation or lots of hassle."

New Client/Server Technology Benefits Users and Administrators
The new version of DaVinci eMAIL also takes advantage of new client/server technologies to provide a "Mail Server" configuration option. Deployed as either a MHS gateway or a stand-alone program, Mail Server is designed to improve both the administration and use of e-mail. For administrators, Mail Server delivers e-mail and manages rules operations when users are inactive, and provides the ability to automatically purge wastebaskets of inactive users. Background operation is designed to ease e-mail administration and to accommodate the growing number of "power-down" clients. When the Mail Server option is chosen, e-mail users will notice their start-up and shut-down processes are dramatically faster.

Client/server techniques also have been utilized in DaVinci eMAIL 3.2 to reduce by half the workload associated with new client configurations for network

administrators. With DaVinci eMAIL 3.2, the ADMIN program is necessary only to create basic directory structure; DaVinci eMAIL creates the individual user directories and files automatically the first time the new user launches the application.


<u>Continuing to Build DaVinci eMAIL Brand With Easy Administration, Full Functionality</u>
In addition to the new NDS Address Book choice, DaVinci eMAIL 3.2 also introduces a Recent Addresses address book that stores the most recently used names. The default setting is 10 names, but administrators can redefine the parameter for the entire enterprise or for individual users. For many users who primarily send e-mail to a small circle of people or within their department, Recent Addresses will be a convenient way to avoid scrolling through a long directory of names.

While some of the new features in DaVinci eMAIL 3.2 specifically leverage NetWare 4.1 and MHS Services, DaVinci eMAIL continues to support numerous alternative networking environments and technologies, including NetWare 2.x and 3.x, Global MHS 2.0, Connect2, and MHS 1.5.

First introduced in February 1988, DaVinci eMAIL has become the world's leading NetWare MHS-based electronic mail application through a combination of seamless integration with Novell and the application of new technologies to address customer needs. DaVinci eMAIL was the first Windows e-mail package, the first to have a graphical interface for administration, and the first to integrate with Novell's NDS architecture. By maintaining support for a wide range of Novell's messaging and transport methods as well as end-user platforms, DaVinci eMAIL is perfectly suited for today's heterogeneous computing environment.

DaVinci eMAIL also offers users a great degree of flexibility. Whether it's DOS, Windows or Macintosh, the user interface is intuitive and easy to learn. Behind the simplicity, however, is a powerful and customizable application. A configurable toolbar, conversation threading, collapsible folders and On The Road are among the many advanced features for users.

The DaVinci Rules add-on module maintains the simplicity theme but offers extensive capabilities that end-users can utilize to automate dozens of procedures--from sorting mail to deleting "junk" mail. The version for mobile users, DaVinci eMAIL Remote, fully integrates with Novell's NetWare Remote MHS and allows users the flexibility of using one PC or multiple PCs to access mail from their office, the road or home.


<u>Availability and Pricing</u>

DaVinci eMAIL 3.2 and the DaVinci complementary products are now available from ON Technology and leading VARs and resellers around the world. In North America, the DOS and Windows system pack is $199 and the Macintosh system pack is $595. End-user licenses are available in the following increments: 10-user pack, $790; 50-user pack, $2950; and, 100-user pack $4999. Upgrades for existing users are available from ON Technology.

DaVinci eMAIL Rules and DaVinci eMAIL Remote are sold separately. The Rules module is $595 for 50 users or $995 for an unlimited number of users. DaVinci eMAIL Remote is available as a stand-alone module ($239) or bundled with Rules ($249).

Outside North America, availability and pricing is determined on a country-by-country basis by ON Technology's network of distributors and resellers. Localized editions of earlier versions of DaVinci eMAIL are available in the following languages: German, Hebrew, French, Spanish and Swedish.

DaVinci eMAIL 3.2 is available for free trial through the company's "30 Day Free Trial" program, which provides fully-functional software to users for 30 days without obligation.

To purchase DaVinci eMAIL, order trial software or receive information about any of ON Technology's offerings, there are a variety of methods that can be used. Telephone inquiries can be made by calling 617-374-1400 or toll-free from anywhere in North America by calling 800-767-6683. The ON Technology home page is located on the World Wide Web at http://www.on.com. To request general information over the Internet, send inquires to info@on.com.

ON Technology Corporation is a leading provider of networking products that connect and manage DOS, Windows, Macintosh, and Unix workstations on networks. In addition to DaVinci eMAIL, ON Technology offers Notework Electronic Mail, SofTrack, AuditTrack, Meeting Maker XP and Common Knowledge. Headquartered in Cambridge, Mass., ON Technology now has more than 4 million users worldwide.

## News: ON Technology Expands Cross Platform Support With Macintosh Remote Capability for DaVinci eMAIL



Cambridge, Mass., Aug. 9, 1995--ON Technology Corporation (Nasdaq: ONTC) today announced a new client for its DaVinci eMAIL electronic mail package that is designed to provide remote access to corporate and Internet mail systems from Macintosh platforms.

The new version, DaVinci eMAIL Remote for the Macintosh, is designed for Powerbook and modem-equipped Macintosh computers running Apple Remote Access (ARA) software, which ships with most Powerbooks today or is available from many authorized Apple Computer dealers. DaVinci eMAIL Remote for the Macintosh is a robust electronic mail solution that offers extensive end-user features, such as a configurable toolbar, hierarchical folders, spell checker, color coded messages, and an unlimited number of file attachments.

Prior to this release, the Macintosh platform was restricted to LAN-based access only. With the new remote Macintosh client, DaVinci eMAIL now supports DOS, Windows and Macintosh clients in both local and remote configurations.

"DaVinci eMAIL continues to grow because it offers the mixed environment support that many organizations require," said John Rizzi, ON Technology Vice President of Sales. "We have a LAN-attached Macintosh client that has become popular over the last year. This response and demand for a remote Mac client indicates a vibrant market for cross-platform e-mail solutions."

Availability and Pricing
DaVinci eMAIL Remote for the Macintosh and the DaVinci complementary products are now available from ON Technology and leading distributors and resellers around the world. In North America, DaVinci Remote for the Macintosh is priced at $239 per user. For LAN-attached DaVinci eMAIL, pricing for the Macintosh system pack is $595 and the DOS and Windows system pack is $199. LAN-attached end-user licenses are available in the following increments: 10-user pack, $790; 50-user pack, $2950; and, 100-user pack $4999.

Outside North America, availability and pricing are determined by ON Technology's network of distributors and resellers; contact ON Technology for further information.

DaVinci eMAIL is available for free trial through the company's "30 Day Free Trial" program, which provides fully-functional software to users for 30 days without obligation.

To purchase DaVinci eMAIL, order trial software or receive information about any of ON Technology's offerings, telephone inquiries can be made by calling 617-374-1400 or toll-free from anywhere in North America by calling 800-767-6683. To request general information over the Internet, send inquires to info@on.com. For online information, the ON Technology home page is located on the World Wide Web at http://www.on.com

ON Technology Corporation develops, markets and supports groupware applications and workgroup utilities software, including client/server tools for group scheduling (Meeting Maker XP), group collaboration (Common Knowledge), electronic mail (Notework and DaVinci eMAIL), software metering (SofTrack) and server auditing (AuditTrack). ON software is designed to be simple to install and easy to use, supports multiple client platforms, requires minimum training and addresses proven customer needs. A publicly held company trading under the symbol ONTC since August 1, 1995, ON Technology Corporation is headquartered in Cambridge, Mass.

## News: ON Technology Enhances Scheduling Software To Allow Meeting Notices Through E-Mail, Proxies Across Servers



May 26, 1995, Cambridge, Mass.--ON Technology Corporation announced today a new version of its award-winning Meeting Maker XP group scheduling software that expands on the product's LAN and Internet support by adding the ability to share meeting notices and details through a user's e-mail package. The new e-mail integration features allows Meeting Maker XP users to easily send notification of meetings to colleagues at other company locations or with business partners, vendors and customers.

In addition to increasing the ways organizations of all sizes can schedule meetings over wide areas, such as between headquarters and a remote office or between a company and one of its business partners, Meeting Maker XP Version 3.0 features several enhancements for both end-users and administrators.

New end-user capabilities include cross-server proxy rights, company holiday designations, easy calendar conversions from competitive products, and enhanced Windows notifications and reminders.

For network administrators, Meeting Maker XP v3.0 offers greater flexibility and security for overall network management. New features designed specifically to improve group-scheduler administration are automatic server shut-down and back-up capabilities and a "Move User" feature.

"The combination of MAPI support for e-mail integration and TCP/IP support for Internet communications makes Meeting Maker XP a powerful cross-platform group scheduler for Windows, DOS and Macintosh networks," said John Rizzi, Vice President of Sales for ON Technology.

Wide Area Scheduling Via E-Mail and the Internet
The new e-mail integration in Meeting Maker XP v3.0 opens the world of group scheduling to anyone accessible via e-mail. This new feature allows Meeting Maker users to easily coordinate their schedule and communicate details of the meeting with anyone who is accessible via the network or through an e-mail provider, such as the Internet, CompuServe or America Online.

Prior to this new version, Meeting Maker users could only send meeting proposals to other Meeting Maker users on their network. By adding support for the Windows Messaging API (MAPI), Meeting Maker v3.0 users can go beyond the limits of their Meeting Maker guest list to schedule meetings with anyone accessible through their e-mail address book. This allows Meeting Maker users

who also have a MAPI-based e-mail application, such as ON Technology's DaVinci eMAIL, Microsoft Mail and Lotus cc:Mail, to effectively coordinate meetings with anyone that has an e-mail address.

To propose a meeting with someone not on the Meeting Maker guest list, Version 3.0 provides an "External" guest button in the Meeting Proposal window that opens up the user's e-mail address book. From this window, the Meeting Maker user scans their e-mail address book or enters an e-mail or Internet address, and then clicks on "OK". The recipient of the Meeting Maker proposal receives an e-mail message containing all of the pertinent meeting information such as the date, time, location, guests and agenda.

Other Enhancements Improve Enterprisewide Group Scheduling
The new version of Meeting Maker also gives users the ability to expand the "proxy" capability to multi-server environments. Previously, the Meeting Maker proxy capability allowed users on a common server to give authorization to specific people to view or manage their calendar--for example, an executive may grant "proxy" rights to their calendar to an assistant who needs to know their whereabouts or book meetings on their behalf. With Version 3.0, users can proxy their calendar to anyone on their company's network. This new cross-server feature gives LAN administrators the freedom to structure and restructure server groups without worrying about upsetting the established calendar proxy system that users create on their own.

The new holiday designation feature allows company-wide holidays to appear as "inactive work days." With this distinction, the "after hours" icon alerts the user if they attempt to schedule a meeting on a company designated holiday.

Meeting Maker XP v3.0 also features a new utility to import calendar data from competitive scheduling products, such as Microsoft Schedule+, Microsystems Software CaLANdar, and Now Software Now-Up-to-Date. The new version also includes an enhanced Windows notification feature that allows the Meeting Maker icon to float over other applications and screen savers to remind users of appointments and provide notification of new meeting proposals.

For the administrator, the new release includes a scheduled server shut-down feature that performs automatic back-ups of the Meeting Maker XP server(s), ensuring LAN administrators that meeting data can be recovered in case of a disaster. Meeting Maker v3.0 also includes a Move User feature that allows administrators to easily move user accounts between servers.

First introduced in March 1991, Meeting Maker XP automates the process of proposing meetings, coordinating agendas, and securing a meeting location with the necessary equipment. With Meeting Maker XP, all of this is done seamlessly between any Windows, Macintosh, or DOS workstation. To-Do lists, auto picking

of available meeting times, and the ability to coordinate meetings seamlessly across platforms are just a few of the features that have allowed Meeting Maker XP to win numerous awards.

Availability, Pricing and Information
In North America, Meeting Maker XP v3.0 is available immediately through ON Technology in license-pack multiples of 10, starting at $79 (US) per user. Upgrades for existing users are $29 (US) per user. Outside North America, availability and pricing are determined on a country-by-country basis by ON Technology's worldwide network of distributors and resellers.

Meeting Maker XP v3.0 is available for free evaluation, as are all ON Technology products, through the company's "Free 30 Day Trial" program, which provides fully-functional software to users for 30 days without obligation.

To purchase Meeting Maker XP, order trial software or receive information about any of ON Technology's offerings, there are a variety of methods that can be used. Telephone inquiries can be made by calling 617-374-1400 or toll-free from anywhere in North America by calling 800-767-6683. The ON Technology home page is located on the World Wide Web at http://www.on.com. To request general information over the Internet, send inquires to info@on.com.

ON Technology Corporation is a leading provider of networking products that connect and manage DOS, Windows, Macintosh, and Unix workstations on networks. In addition to Meeting Maker, ON Technology offers DaVinci eMAIL, Notework Electronic Mail, SofTrack, AuditTrack and Common Knowledge. Headquartered in Cambridge, Mass., ON Technology now has more than 4 million users worldwide.

## News: ON Technology Expands Platforms for Notework Electronic Mail, Adding Macintosh and Windows NT Client Support

Cambridge, Mass., July 14, 1995--ON Technology Corporation announced today that its popular Notework Electronic Mail package is now available for Macintosh and Windows NT clients, expanding the company's long-time support for DOS and Windows 3.1 into new environments. The new version, Notework Electronic Mail 4.0, also supports a third new environment, Microsoft Windows under 0S/2 Warp.

In addition to new client support for Notework 4.0, other enhancements are designed to support larger environments, Novell's VLM 1.2, the fast-growing base of "mobile" Notework users, and workstation performance.

Along with the upgrade for Notework Electronic Mail, its complementary package for mobile users, Notework Mobile Office, also has been enhanced. First introduced in December 1994, Notework Mobile Office has quickly become an easy and reliable way for users to access their corporate e-mail from the road, home or field office.

"Thanks to customer loyalty and input, the best little e-mail for Novell NetWare LANs just got better," said John Rizzi, Vice President of Sales, ON Technology. "While our DOS and Windows client base continues to grow at a steady pace, we can now look forward to sustained growth with new Mac and WinNT client support as well as improvements for our Notework Mobile Office users."

Notework is an extraordinarily easy to use electronic mail and telephone messaging package for Novell NetWare local area networks. While supporting many of the value-added features of more sophisticated e-mail packages, Notework is designed to be installed on the LAN in 5 minutes, to be used by end-users within 5 minutes, and to be administered with minimal effort. Since its introduction in 1989, Notework has gained a large and loyal following among DOS and Windows users because of its simplicity and low overhead.

Now, with Notework 4.0, both Macintosh and Windows NT clients as well as OS/2 users who want to run Notework as a Windows application can enjoy the immediate benefits available from Notework. For Macintosh users, the Notework interface takes advantages of the distinctive Mac desktop while carrying forward its award-winning "easy to install, learn and use" personality.

For Windows users, significant performance improvements have been incorporated into Notework 4.0 by reducing memory allocation by 200K and by reducing the frequency of disk access. "Existing Notework for Windows users

should notice immediately that it's a lot faster to open, put away, file and delete mail with Notework 4.0," said Rizzi.

## Notework Mobile Office Also Enhanced with Notework 4.0

The new version of Notework 4.0 also includes enhancements to the Notework Mobile Office package. For the "truly mobile" user who doesn't have or require a "home office" mailbox, there is no longer any need to have a "LAN account" in order to use Notework Mobile Office.

Notework Mobile Office 4.0 now also supports the mobile user who has more than one "mobile" platform. For example, some users need to access corporate e-mail from the road with a laptop, from home with a desktop PC and modem, and maybe even from a field office from another desktop PC.

A third enhancement for Notework Mobile Office provides end-users with a time stamp for their last "Mobile Office Synchronization." With this notice, end users will be able to easily determine when the last time they did a "mosynch" to the LAN to refresh their in-box.

## Several Enhancements For Network Adminsitrators

The new version of Notework includes several changes designed specifically to improve the administration aspects of corporate electronic mail systems. Notework 4.0 now supports up to 1200 addresses per server and an unlimited number of NetWare servers, whereas Notework previously was limited to a total of 100 servers. Enterprisewide, Notework 4.0 can support as many as 50,000 addresses. Notework 4.0 also now supports Novell VLM Version 1.2 while continuing to maintain support for VLM 1.0 and VLM 1.1.

## Availability, Pricing and Information

In North America, Notework 4.0 is available immediately through ON Technology. The DOS and Windows system pack is $199 and the Macintosh system pack is $995. License packs in 10-user multiples are priced at $59 per user. The system pack for Notework Mobile Office is $499, and user pricing begins at $299 per license. Upgrades for existing Notework and Notework Mobile Office users are available at a nominal fee

Outside North America, availability and pricing are determined on a country-by-country basis by ON Technology's worldwide network of distributors and resellers.

Notework 4.0 is available for free evaluation through the company's "30 Day Free Trial" program, which provides fully-functional software to users for 30 days without obligation. Telephone inquiries can be made by calling 617-374-1400 or

toll-free from anywhere in North America by calling 800-767-6683. The ON Technology home page is located on the World Wide Web at http://www.on.com. To request general information over the Internet, send inquires to info@on.com.

ON Technology Corporation is a leading provider of networking products that connect and manage DOS, Windows, Macintosh, and Unix workstations on networks. In addition to Notework Electronic Mail, ON Technology offers DaVinci eMAIL, SofTrack, AuditTrack, Meeting Maker XP and Common Knowledge. Headquartered in Cambridge, Mass., ON Technology now has more than 4 million users worldwide.

## News: ON Technology Releases New Version of SofTrack Metering Software That Capitalizes on Novell's NDS Administration Strength



June 16, 1995, Cambridge, Mass.--ON Technology Corporation announced today a new version of SofTrack, the award-winning software metering package, that furthers the company's strategy of complete NetWare integration by adding native support for Novell's NetWare Directory Services (NDS).

Software license metering is one of the most critical issues facing network administrators today. By monitoring software licenses, an organization is able to comply with stringent software license agreements and, perhaps most importantly, purchase only the number of software licenses and upgrades that its actual usage requires. SofTrack, developed by application metering expert John T. McCann, is compatible with any DOS, Windows, OS/2 or Macintosh application launched from a NetWare server.

The new release of SofTrack, Version 2.5, is available in license packs to match the NetWare server license; upgrades for users of SofTrack 2.x versions are free and for SofTrack v1.x a nominal fee applies.

"In addition to leveraging the administration efficiency of the NDS architecture, SofTrack v2.5 continues to expand on the metering strength of our previously available award-winning versions of SofTrack," said John Rizzi, ON Technology Vice President of Sales. "SofTrack v2.5 is a valuable tool for network administrators who are responsible for license compliance or want to reduce expenditures for software procurement and upgrades."

Native Integration with Novell's NDS Eases Software Metering Management
SofTrack's new NDS support is designed to take full advantage of Novell's hierarchical directory tree system for efficiently administrating servers, users, groups and other objects in a global network environment. While SofTrack v2.5 provides maximum benefits for NetWare 4.x servers, eliminating the previous requirement to run NetWare in bindery services mode when metering 4.x environments, SofTrack v2.5 continues to be compatible and valuable for NetWare 3.x environments. Migration of bindery-based SofTrack data structures to NDS is included.

"The new version of SofTrack from ON Technology is an excellent example of an application that capitalizes on the strength of NDS," said Bill Mason, director of Partner Marketing for Novell, Inc. "Many of our NetWare customers are migrating to NetWare 4.1 because NDS provides the administration tools to efficiently manage large, global enterprise networks as well as departmental LANs and small businesses."

SofTrack v2.5 is integrated into the NetWare administration utility through an NWAdmin Snapin DLL, providing a strong visual method for identifying SofTrack objects. For each NetWare server, SofTrack creates an Organizational Unit (OU) in NDS for its objects relating to that server. This integration at the OU level eliminates excessive NDS synchronizations. As allowed by the NWAdmin tool, assignment of SofTrack administrators is facilitated by the new OU structure on a server-by-server basis, simplifying SofTrack administration.

Under the NDS schema, SofTrack creates three new Object Classes within NDS: SofTrack Administration, SofTrack License Profile and SofTrack Saved Report Definition. In this manner, SofTrack objects can be stored efficiently and can be moved to another location on the NDS tree with a simple series of point-and-click commands. An added benefit of this level of NDS integration is that any NDS-enabled archiving software can be used to backup SofTrack's data structures.

The new version of SofTrack v2.5 also facilitates subtree NDS searches by allowing the network administrator to focus in on a specific NDS "context" area. The ability to minimize searches by server or group can eliminate a lot of time a network administrator would need to search through thousands of users spread over scores of servers. Also, without "context" NDS searches, creating or adding NDS Users or Groups to SofTrack can be an arduous, time consuming process.

Leading the Metering Market With More New Enhancements
The new version of SofTrack also has been enhanced to make report building and printing an easier and faster process. The new Printed Usage Report Definition screen features a "tabbed dialog box" format that makes the selection of type, output method, date ranges, users and licenses a simple point-and-click execution. Reports can be displayed on the screen, saved as a file, or printed on paper for as many as 8000 users, eclipsing the old report limit of 1200-1800 users per server. As with previous versions, pre-formatted reports include ones for showing organizational or per-server license use or for showing a particular individual's license use.

A third major enhancement in the new version, Time Zone Support, gives network administrators the ability to report on wide-area usage adjusted by local time zones.

Continuing to Build On Award-Winning Capabilities
First released in October 1993, SofTrack is a NetWare Loadable Module (NLM) that meters software license usage of server-based applications. SofTrack can be installed on a NetWare server in approximately five minutes and does not require any modification to individual workstations. As a server-based metering tool, individual users can not delete or override its function. Since its debut, SofTrack

has won recognition and numerous awards from industry publications, including Network Computing, PC Week, LAN Times and NetWare Solutions.

With SofTrack on their network, organizations can be assured that they are fully license compliant under terms and conditions of the software manufacturer and the Software Publishers Association (SPA). A SofTrack metering report is accepted as evidence of compliance by the SPA.

The new version continues to build on features previously available. A "Suite Metering" capability allows network administrators the freedom to assign individual application licenses or a complete suite license depending on the individual user's demand for applications that are generally more cost effective as a suite offering.

A wide variety of reports can be produced in tabular, pie chart, or bar graph format to show how an individual, group or complete organization uses software licenses. An "Allow Overflow" switch is provided to permit network administrators the option of exceeding the license limits they have set in order to meet periodic peak demand or as a means of triggering new license purchases.

A "Block Usage" feature allows network administrators to prevent certain applications from being used (such as games) either completely or at certain times. This feature also is useful for times when administrators need to block access to a certain application in order to upgrade the version.

Beginning with SofTrack v2.1, ON Technology provided NetWare SFT III administrators the ability to meter software on their NetWare 3.11 and NetWare 4.1 networks without any modification to individual workstations.


Availability, Pricing and Information
In North America, SofTrack v2.5 is available immediately through ON Technology in license-packs matching the NetWare license for concurrent usage: 50-user license at $495 (US) per server, 100-user at $895, 250-user at $1295, 500-user at $2395 and 1000-user at $3995. Upgrades for existing SofTrack 2.x users are free; for SofTrack 1.x users there is a nominal upgrade fee.

Outside North America, availability and pricing are determined on a country-by-country basis by ON Technology's worldwide network of distributors and resellers.

SofTrack v2.5 is available for free trial through the company's "30 Day Free Trial" program, which provides fully-functional software to users for 30 days without obligation.

To purchase SofTrack, order trial software or receive information about any of ON

Technology's offerings, there are a variety of methods that can be used. Telephone inquiries can be made by calling 617-374-1400 or toll-free from anywhere in North America by calling 800-767-6683. The ON Technology home page is located on the World Wide Web at http://www.on.com. To request general information over the Internet, send inquires to info@on.com.

ON Technology Corporation is a leading provider of networking products that connect and manage DOS, Windows, Macintosh, and Unix workstations on networks. In addition to SofTrack, ON Technology offers DaVinci eMAIL, Notework Electronic Mail, AuditTrack, Meeting Maker XP and Common Knowledge. Headquartered in Cambridge, Mass., ON Technology now has more than 4 million users worldwide.

## News: Introducing Cenergy: Best of Breed Desktop Asset Management Suite From Tally Systems



*Package to include OnDemand Software's World Renown WinINSTALL Software*

HANOVER, NH--June 19, 1995--Tally Systems Corp. and OnDemand Software, Inc announce today an agreement that allows Tally Systems to include WinINSTALL in Cenergy, a new, NOS-independent, best-of-breed desktop asset management suite that includes:

- Tally Systems' NetCensus--automatic hardware and software inventory for all your PCs

- Tally Systems' CentaMeter--comprehensive software license management and metering

- OnDemand Software's WinINSTALL--effortless software distribution.


"Our integration of WinINSTALL with industry leading asset management products, like Tally Systems' NetCensus and CentaMeter applications, represents the next generation in network management tools," states Neal Ater, president of OnDemand Software. "This type of product combination provides solutions to the areas where the major management suites are lacking, giving the network administrator community what they've asked for and truly what they need."

"Organizations want one source of purchase and support for desktop asset management tools. Through this agreement with OnDemand, Tally Systems offers the flexibility to purchase these best of breed products in a suite, Cenergy, or separately as NetCensus, CentaMeter and WinINSTALL. Our customers will not have to sacrifice quality for the benefits of a suite," explains Ted Jastrzembski, president of Tally Systems.

Cenergy offers organizations complementary asset management tools with one point of purchase, one point of technical support, and one point of access on the desktop. Initial links between the inventory, metering and software distribution functions include:

A flexible console that provides one point of access for NetCensus, CentaMeter and WinINSTALL. The console is customizable so administrators can add additional asset management tools.

A built-in NetCensus application list in CentaMeter, making initial setup quick

and easy.

Built-in access from WinINSTALL to NetCensus configuration detail reports so you can see which machines are ready for the software you need to distribute.

A built-in button in WinINSTALL that brings up the CentaMeter application define screen so you can easily start metering the software you just distributed.

Future editions of Cenergy will incorporate additional functionality and integration.

Cenergy is currently shipping and is licensed on a per-PC basis. Price is dependent on total number of PCs; for example, $33.95 per PC for 100 PCs, $25.50 per PC for 1000 PCs. NetCensus, CentaMeter and WinINSTALL can be purchased individually or bundled. Call Tally Systems for pricing and multiple product discounts. Product Recognition Updates (PRUs) and technical support are free for one year. Fullfeatured product upgrades are free for a year with orders of 50 licenses or more.

For more information about Cenergy, NetCensus, CentaMeter or WinINSTALL, contact Tally Systems Corp., P.O. Box 70, Hanover, NH 03755, (800) 262-3877, (603) 643-1300, fax (603) 643-9366 or via Internet at product.information@tallysys.com.

OnDemand Software, Inc. provides development, sales, marketing, and technical support for software products that assist the management of networks and PCs in the client/server environment. OnDemand distinguishes itself by providing the strategic, tactical, and technical tools network professionals need to simplify their administrative tasks while helping them to stay a step ahead of technology changes that affect their operations and profitability of their businesses. OnDemand Software's WinINSTALL, the popular electronic software distribution product, currently supports over 1 million workstations worldwide with over 10,000 network servers.

Tally Systems Corp., the inventor of and continued pacesetter in Census Recognition Technology, is the world's leading supplier of fullfeatured desktop asset management products, providing packaged software solutions to improve management of enduser computing resources in organizations around the world. These leading-edge products are currently licensed on almost 2,000,000 PCs at 6,000 client sites worldwide.


WinINSTALL is a trademark of OnDemand Software, Inc.

NetCensus, Cenergy, CentaMeter and Census Recognition Technology are trademarks of Tally Systems Corp. All other brand names or trademarks or registered trademarks are the property of their respective holders.

## News: Unisys Selects Tally Systems Products for Desktop Services Program

HANOVER, NH, July 17, 1995--Ensuring continued excellence in asset management services and products for its Desktop Services customers, Unisys Corporation has entered into an agreement with Tally Systems Corp., the leading supplier of full-featured desktop asset management products. Under the agreement, Unisys will resell and utilize Tally Systems' products, NetCensus (automatic inventory software) and CentaMeter (metering and software license management software) in its extensive multivendor Desktop Services program.

"One of the main reasons Unisys is experiencing great success in the multivendor desktop services market is that we have taken a completely objective, best-of-breed approach in delivering our solutions," said Keith Tomson, director of Services Product Development, Unisys Global Customer Services. "The accuracy and flexibility of NetCensus and CentaMeter are outstanding. Plus, we know that these products always generate the most up-to-date information since Tally Systems updates its inventory product recognition database every 60 days. We welcome Tally Systems as a best-of-breed partner in our Desktop Services program."

"We commend Unisys for addressing the growing need to provide complete and accurate asset management for their customers. Tally Systems' NOS-independent products are uniquely focused on aspects of asset management that servicers need to provide--they are comprehensive but flexible tools that work in multi-NOS, multi-platform and multi-vendor environments," states Tom Cecere, vice president, Tally Systems Strategic Alliances. "Unisys Desktop Services customers are located worldwide. NetCensus' recognition of foreign language versions of software really helps Unisys provide superior desktop asset management services on a global scale."

The Unisys Desktop Services program is a single source for the services, technical expertise and multivendor products required in the ongoing management of open distributed desktop environments worldwide. The program comprises asset management, maintenance, configuration and integration, help desk, network integration, education, and other services for maximizing desktop system availability, optimizing end user productivity, and quantifying and holding down costs.

Tally Systems' Strategic Alliances Program supports service organizations and third-party vendors in utilizing Tally Systems' products. Participants in the Strategic Alliances program receive comprehensive technical and sales training. NetCensus is a NOS-independent software package that automatically tracks

hardware and software components on networked and stand-alone PCs. NetCensus inventories DOS, Windows, OS/2 and Macintosh computers, plus file servers on most network operating systems. CentaMeter is a NOS-independent metering and software license management tool that monitors suites, license compliance, and optimizes software usage for both network and locally installed Windows and DOS applications. The Software Publishers Association (SPA) accepts NetCensus and CentaMeter reports for the purpose of assessing software license compliance. NetCensus and CentaMeter are packaged individually and as a part of Cenergy, Tally Systems' NOS-independent best-of-breed desktop asset management suite of inventory, metering and software distribution products.

Service organizations and third-party organizations interested in participating in Tally Systems' Strategic Alliances Program can contact Tally Systems directly at P.O. Box 70, Hanover, NH 03755, (800) 262-3877, (603) 643-1300.

Tally Systems Corp., the inventor of and continued pacesetter in Census Recognition Technology, is the world's leading supplier of fullfeatured desktop asset management products, providing packaged software solutions to improve management of enduser computing resources in organizations around the world. These leading-edge products are currently licensed on almost 2,000,000 PCs at 6,000 client sites worldwide.

Unisys is a registered trademark of Unisys Corporation.
NetCensus, Cenergy, Census Recognition Technology, CentaMeter and NetCensus are trademarks of Tally Systems Corp. All other brand names or trademarks or registered trademarks are the property of their respective holders.

## News: Lotus Showcases Next Generation Messaging Products at EMA Show & Conference



*Demos MAPI-compliant version of cc:Mail; Highlights Notes Release 4.0 Messaging*

NEW ORLEANS, May 9, 1995--Lotus Development Corp. Is demonstrating forthcoming components of its Lotus Communications Architecture at the Electronic Messaging Association (EMA) show and conference opening here today. Among the company's next-generation communications products being showcased are: a pre-release, MAPI-compliant version of the Lotus cc:Mail user agent that operates with both file-sharing and client/server-based messaging infrastructures; and the current test release of Lotus Notes Release 4.0, which will feature the cc:Mail user interface.

Lotus is demonstrating the cc:Mail prototype running on Windows 95. This upcoming client can invoke Lotus' MAPI Service Provider Interface to supply connections to either the cc:Mail file-sharing post office, the Lotus Notes Release 4.0 server, or any other MAPI-compliant post office or server. In addition to these enhancements to back-end services, this forthcoming version of cc:Mail will provide cc:Mail users operating in client/server or file-sharing environments with many new messaging enhancements, such as rich text, hierarchical folders and personal address books.

"Lotus' plug-and-play approach to messaging enables organizations to take advantage of our modular or component-based architecture, allowing customer-controlled migration from file-sharing to client/server-based messaging if desired, as well as to fully integrated messaging and groupware as needed," said Michael Zisman, vice preident of Lotus' Communications Business Group. "By using open APIs, Lotus' architecture enables customers to select their front-end clients and back-end services based on best of breed products."

Lotus is also showcasing messaging capabilities of the upcoming Lotus Notes Release 4.0, which in addition to inheriting the cc:Mail user interface, brings a wide range of new enterprise messaging capabilities to users, administrators and application developers.

Lotus will demonstrate how integrated messaging and groupware uniquely provides users with the ability to connect simple electronic messages to documents stored in a shared discussion database or object store. This allows users to reference a document via e-mail, without having to attach or imbed the

document into the message. As a result, this significantly reduces storage and communication system resources and ensures a recipient has the most recent copy of a document.

These capabilities and others are made possible by the distributed object store inherent to Lotus Notes. An object store is a highlyflexible container that enables an object--whether a document, e-mail message, graphic, video clip or scanned image--to be easily and securely stored, managed and retrieved through links or direct user manipulation. Notes' object-based message store not only makes interpersonal mail more efficient and easier to manage, but also represents the critical architectural component required for the development of the high-return business process applications that have made Lotus Notes so popular. Notes also offers fundamental groupware technologies, such as replication, document and field level security, application development and directory management, in addition to an object-based architecture and fully integrated messaging.

In a conference keynote address entitled "Messaging, Groupware and Inter-Enterprise Computing," Jim Manzi, Lotus' president and CEO, said, "As an industry, we've learned that groupware is not a product category that builds upon or is separate from messaging. Rather, it is the natural evolution of messaging for organizations that want to exploit messaging technology beyond simple interpersonal mail to include high-return business process applications, for areas such as customer service, sales force automation and human resource management."

Manzi stresses Note's vital role in today's more decentralized business organizations. "By combining messaging and groupware services into a single unified architecture, every application--including electronic mail--can take advantage of the services of the architecture. Organizations can not only build applications that allow teams within and between companies to communicate, but also to collaborate on common projects, ideas and documents and to coordinate complex business processes. This cannot be achieved with messaging alone," Manzi said.

Lotus also announced today a new service called MCI Connect for cc:Mail. Available from MCI, this service lets cc:Mail customers use MCI's globalmessaging network to connect to users on multiple messaging systems. Lotus is also previewing an Internet World Wide Web capability for cc:Mail that allows users to retrieve cc:Mail messages from any terminal with Web access, much like users of public telephone when they retrieve voice mail messages. This complements the company's recently shipped InterNotes Web Publisher and InterNotes News products.

Lotus Notes is the leading client-server platform for developing and deploying strategic groupware applications that help organizations communicate, collaborate and coordinate strategic business processes

within and beyond their organizational boundaries to achieve improved
business results. More than 5,500 companies and 1.57 million people use Notes
to improve key business processes such as customer service, sales and account
management, and product development. Lotus Notes supports all major
operating systems including IBM OS/2 Warp, Apple Macintosh OS, Microsoft
Windows and Windows NT, and UNIX platforms including IBM AIX, Sun Solaris,
HP-UX, and SCO OpenServer. Notes is also available as a NetWare loadable
module for the Novell environment

With more than 7 million licenses sold worldwide, award-winning features and
availability on all popular platforms, cc:Mail is the world's most popular LAN-
based e-mail system. cc:Mail runs on Windows, Macintosh, OS/2, UNIX and MS-
DOS platforms across all major LANs, providing transparent connectivity to all
major private and public electronic mail systems and facsimile machines
worldwide.

Lotus Development Corp. (NASDAQ: LOTS), founded in 1982, offers high
quality software products and support services that reflect the company's
unique understanding of the new ways in which individuals and businesses must
work together to achieve success. Lotus' innovative approach is evident in a new
class of applications that allows information to be accessed and communicated in
ways never before possible, both within and beyond organizational boundaries.
The company now markets its products in more than 80 countries worldwide and
provides numerous support services, both from its consulting division and its
award-winning 24-hour support center.

 EDITOR'S NOTE: All Lotus news releases are available on the Internet, via
 the Lotus Development Corp. Home Page at http://www.Lotus.com. The Lotus
Home Page is an easy way to find information about Lotus and its business
partners' products and services.

All prices and terms for the US only.

Lotus and Lotus Notes are registered trademarks and Notes, InterNotes,
InterNotes Web Publisher, and InterNotes News are trademarks of Lotus
Development Corp. cc:Mail is a trademark of cc:Mail, Inc., a wholly
owned subsidiary of Lotus Development Corp. All other company and product
names may be trademarks of the respective companies with which they are
associated.

# News: Lotus Delivers NotesView for Managing Today's Notes Enterprises



*Provides Systems Administrators with Graphical, Enterprise-Strength Notes Management Tool*

CAMBRIDGE, Mass., June 19, 1995--Lotus Development Corp. today announced it will begin shipments this week of Lotus NotesView, a graphical product that allows systems administrators to manage and control their Lotus Notes environments in a more reliable and cost-effective manner.

Designed for use with today's Notes Release 3.x networks, NotesView features a Windows-based, graphical management station with a color-coded display that provides real-time, easy-to-read information about Notes environments, including server, replication, and mail routing facilities.

The product is based on industry-standard network management platforms and protocols, and makes use of traditional network management tools, such as maps, point-and-click operations, and real-time monitoring.

"We believe NotesView represents the next major evolution in systems management," said Jeff Papows, vice president of the Lotus Communications Business Group. "NotesView goes beyond today's device-oriented network management products to enable management of application-centric services, such as replication, database server statistics and messaging--and it uses the types of tools administrators already know. Beginning with NotesView, our strategy is to increase the number and quality of tools available to systems administrators, so that they can more accurately predict and manage application-oriented services, while decreasing the need for Notes-specific systems management expertise."

This initial version of NotesView is based on Hewlett-Packard's HP OpenView integrated network and system management software, and includes optional agents based on the Simple Network Management Protocol (SNMP).

Reduced Cost of Ownership
The NotesView product features the Windows-based management station and agents, which collect comprehensive system, database, replication, mail, and network information from servers running Notes platforms--including Windows NT, OS/2, Novell NetWare Loadable Module and UNIX. The NotesView

management station can store such information locally, then use it to graphically display changes in the Notes environment as they occur, as well as create reports or provide alerts and alarms when various conditions apply.

A single management station can be set up to enable administrators to oversee an entire Notes enterprise or multiple management stations can be established to delegate NotesView management tasks. NotesView also allows servers to be managed remotely, providing further cost savings to corporations by reducing overall staff and training expenses.

Because NotesView makes use of industry-standard network management protocols, platforms and conventions, the overall cost of managing the Notes network can be vastly reduced.


Increased Reliability
NotesView also provides improved reliability in the Notes environment, allowing administrators to maintain predictable service levels for their Notes users.

Using NotesView's alarms, administrators are alerted to server issues and fluctuations before they develop. For example, thresholds can be set for factors such as server disk space, mail volume and user load. A color-coded map automatically changes to reflect the status of the Notes environment when an administrator-defined threshold is crossed. NotesView can be customized to issue an alert via an audible sound or icon color change, or alternatively, by mail or pager message.

Topological maps can be used to display information such as the replication paths or messaging routes between servers as well as the health of these connections. Administrators can create new map views tailored to meet specific criteria. For example, map views can be created to correspond to individual workgroups or physical sites.

Administrators also can use NotesView to monitor the health and performance of servers over time and under different loads, generating historical data that can be invaluable in management reporting and planning for future Notes deployments.

For organizations standardhzed on SNMP, Lotus provides SNMP-based agents, which reside on Notes servers and collect and pass the information back to the NotesView management station or other SNMP-based management stations.


Availability, Pricing and Systems Requirements

The NotesView Management station requires HP OpenView for Windows 7.2 or HP OpenView Workgroup Node Manager 1.0 for Windows. NotesView Agent support initially includes OS/2, Windows NT, and Novell NetWare.

NotesView Agent support will be available for Sun Solaris 2.3, HP-UX, IBM AIX and SCO later this year. Support for a UNIX-based NotesView management station is also planned this year, along with an application programming interface (API), that will enable Lotus Business Partners and Notes Developers to monitor their applications via NotesView.

NotesView will be available on June 21, 1995 through Lotus Business Partners and Lotus Authorized Corporate Resellers. Flexible pricing options are available, depending on the size of the Notes network. Lotus NotesView for Workgroups, for managing sites with one to ten servers, is available at an estimated retail price of $3,500; NotesView for the Enterprise, which can manage up to 150 Notes servers, is available at an estimated retail price of $6,000. Trade-ups from workgroups to large sites are available at an estimated retail price of $3,000.

The NotesView management station requires Lotus NotesView Management Station Software, Lotus Notes Release 3.31 client software for Windows, and HP OpenView for Windows - Workgroup Node Manager R 1.0, available at a suggested retail price of $1,495. Notes servers managed by NotesViewdo not require any additional software, but administrators may choose to add the NotesView Agent software for additional capabilities including SNMP support.

For more information on Lotus Notes or NotesView, in North America, call Lotus at 1-800-346-1305.

Lotus Notes is the industry standard client-server platform for developing and deploying groupware applications. It allows people to access, track, share and organize information in ways never before possible, even if they are only occasionally connected to a network. More than 5,500 companies and 1.57 million people use Notes to improve business processes, including customer service, sales and account management, and product development.

Lotus Development Corp. (NASDAQ: LOTS), founded in 1982, offers high quality software products and support services that reflect the company's unique understanding of the new ways in which individuals and businesses must work together to achieve success. Lotus' innovative approach isevident in a new class of applications that allows information to be accessed and communicated in ways never before possible, both within and beyond organizational boundaries. The company now markets its products in more than 80 countries worldwide and provides numerous support services, both from its consulting division and its award-winning 24-hour support center.

EDITOR'S NOTE: All Lotus news releases are available on the Internet, via the Lotus Development Corp. Home Page at http://www.Lotus.com. The Lotus Home Page is an easy way to find information about Lotus and its business partners' products and services. All prices and terms are for the U.S. only Lotus and Lotus Notes are registered trademarks of Lotus Development Corp. Lotus NotesView is a trademark of Lotus Development Corporation. HP OpenView is a trademark of Hewlett-Packard Company. All others are trademarks of their respective companies.

## News: Lotus Announces LotusScript 3.0--Showcases Powerful Programmability Enhancements for Notes Release 4.0



NEW YORK, June 20, 1995--Lotus Development Corp. today announced LotusScript 3.0, a cross-platform, BASIC compatible, object-oriented programming language that will be embedded in the native application development environment of the forthcoming Lotus Notes Release 4.0. During a demonstration at PC Expo, Lotus also showcased significant Notes Release 4.0 programmability enhancements, including Navigators and Agents, which will offer developers a richer set of development tools.

"LotusScript 3.0 will give our community of Notes developers critical new capabilities to help them accelerate the deployment of Notes applications that automate strategic business processes," said Jeff Papows, vice president of the Lotus Communications Business Group. "LotusScript 3.0 offers our corporate developers and Lotus Business Partners robust, object-oriented programming. And, with LotusScript to be delivered in the next releases of all our desktop products, Lotus will have an unrivaled offering for cross-product Team Computing solutions."

LotusScript in Notes Release 4.0 significantly enhances client/server application development by offering:

* Programming capabilities based on a standard, structured language BASIC), enabling richer, more customized applications within the Notes environment

* A new method to access and manipulate Notes system objects, which will accelerate application development and leverage Notes' unique replication model as well as Notes' integrated messaging and groupware infrastructure

* A reduced learning curve for Microsoft Visual Basic and Visual Basic for Applications programmers, offering cross-platform client/server development options and easy access to the Notes application development environment

* Integration with relational and transaction systems via the LotusScript Data Object, allowing easy access to, and integration with corporate legacy information

## Rapid Application Development and Customization
LotusScript 3.0 builds on the Notes Release 4.0 application evelopment
environment by providing a consistent, easy-to-use, structured
programming language in addition to the existing Notes macro language.
Structured programming languages, with their support for control
structures, looping mechanisms, and data structure management, enable the
development of more powerful customized solutions. A superset of BASIC, and a
cross-platform language, LotusScript 3.0 will run on all Notes platforms, including
IBM OS/2 Warp, Apple Mac OS, Microsoft Windows and Windows NT, and UNIX
platforms including IBM AIX, Sun Solaris, HP-UX, and SCO OpenServer.

LotusScript 3.0 provides developers with an object framework that makes
it easier to access and drive Notes data structures and services.
Accessing and manipulating Notes objects such as databases and documents
will appear logical and intuitive to developers who are experienced in object-
oriented programming techniques. Coupled with the Notes distributed object
store, developers can divide applications into
components that can be collected, maintained, processed, reused and
distributed, as well as reported on, using Notes' messaging and replication
services.

## Accelerating Application Development
With the introduction of LotusScript 3.0, Notes developers will gain,
for the first time, a robust debugging environment for developing and testing
Notes applications. Breakpoints, object inspection, flow tracing and syntax-
checking capabilities will vastly improve developer productivity in the Notes
environment.

LotusScript 3.0 also includes an Object Browser, which provides instant
access to Notes classes and functions, variables and LotusScript language
elements via drop down lists. In addition, LotusScript 3.0 provides developers
with enhanced features such as the ability to call out to custom applications and
libraries written in C.

## Easy Access to Relational and Legacy Databases
The LotusScript Data Object (LS:DO) provides Notes access to relational and
legacy databases via ODBC. Using LS:DO, developers can link Notes with
relational databases and transaction systems directly within the Notes object
framework. Because the LS:DO provides both read and write access to back-end
databases, developers can build advanced Notes applications that link to
external databases.

## Notes Release 4.0 Offers More Application Development Flexibility

LotusScript 3.0 is one of many enhancements to the Notes Release 4.0 application development environment. Advanced programming tools include:

*Agents: Agents are Notes application logic (written in LotusScript, the Notes macro language or created from Simple Actions). They allow developers or end users to automate tasks such as data handling, replication, and messaging services.

*Navigators: Navigators provide a customizable visual interface through which developers can guide users of Notes applications. Navigators consist of graphical elements combined with hotspots that developers to control Notes application flow. For example, a Navigator could be created to display a map of a sales territory. When the user double clicks on a city within the map, the developer can display the appropriate Notes Document and/or View for that.

*API Enhancements: The Notes Extension Manager will support more than 60 notification events. Developers can "hook" these events, and pass control to an external process. This capability will offer system developers an unprecedented opportunity to integrate external utilities and applications with their Notes solutions, and further emphasizes Lotus' commitment to making Notes an open platform for all developers.


Improved Flexibility and Choice for Developers
Visual Basic developers will find LotusScript 3.0 easy to use since it is compatible with Visual Basic for Applications (VBA). Lotus Notes HiTest developers will welcome the common Notes Object Model, consistent with the object model in the Notes HiTest Application Programming Interfaces (APIs) for C and BASIC. Additionally, since LotusScript 3.0 will be included in Lotus' communications and forthcoming desktop applications, developers will be able to program across different applications with ease. Lotus Notes developers also can choose from a wide range of third party Lotus Business Partner programmability tools.

For more information on Lotus Notes in North America, contact Lotus at 1-800-346-1305.

Lotus Notes is the leading client-server platform for developing and deploying strategic groupware applications that help organizations communicate, collaborate and coordinate strategic business processes within and beyond their organizational boundaries to achieve improved
business results. More than 5,500 companies and 1.57 million people use Notes to improve key business processes such as customer service, sales and account management, and product development. Lotus Notes supports all major operating systems including IBM OS/2 Warp, Apple Mac OS, Microsoft Windows and Windows NT, and UNIX platforms including IBM AIX, Sun Solaris, HP-UX, and SCO OpenServer. Notes is also available as a NetWare Loadable Module for

the Novell environment

Lotus Development Corp. (NASDAQ: LOTS), founded in 1982, offers high quality software products and support services that reflect the company's unique understanding of the new ways in which individuals and businesses must work together to achieve success. Lotus' innovative approach is evident in a new class of applications that allows information to be accessed and communicated in ways never before possible, both within and beyond organizational boundaries. The company now markets its products in more than 80 countries worldwide and provides numerous support services, both from its consulting division and its award-winning 24-hour support center.

EDITOR'S NOTE: All Lotus news releases are available on the Internet, via the Lotus Development Corp. Home Page at http://www.Lotus.com. The Lotus Home Page is an easy way to find information about Lotus and its business partners' products and services. A copy of this release and other company information is also available via fax by dialing 1-800-57-LOTUS within the U.S. and Canada or 201-946-2336 outside the U.S. and Canada. Questions concerning the service should be directed to Lotus' corporate communications department at 617-693-5625.

All prices and terms for the US only.

Lotus and Lotus Notes are registered trademarks and Notes and Lotus WordPro are trademarks of Lotus Development Corp. cc:Mail is a trademark of cc:Mail, Inc., a wholly owned subsidiary of Lotus Development Corp. All other company and product names may be trademarks of the respective companies with which they are associated.

## News: Lotus Announces LotusScript 3.0--Showcases Powerful Programmability Enhancements for Notes Release 4.0

NEW YORK, June 20, 1995--Lotus Development Corp. today announced LotusScript 3.0, a cross-platform, BASIC compatible, object-oriented programming language that will be embedded in the native application development environment of the forthcoming Lotus Notes Release 4.0. During a demonstration at PC Expo, Lotus also showcased significant Notes Release 4.0 programmability enhancements, including Navigators and Agents, which will offer developers a richer set of development tools.

"LotusScript 3.0 will give our community of Notes developers critical new capabilities to help them accelerate the deployment of Notes applications that automate strategic business processes," said Jeff Papows, vice president of the Lotus Communications Business Group.

"LotusScript 3.0 offers our corporate developers and Lotus Business Partners robust, object-oriented programming. And, with LotusScript to be delivered in the next releases of all our desktop products, Lotus will have an unrivaled offering for cross-product Team Computing solutions." LotusScript in Notes Release 4.0 significantly enhances client/server application development by offering:

* Programming capabilities based on a standard, structured language BASIC), enabling richer, more customized applications within the Notes environment

* A new method to access and manipulate Notes system objects, which will accelerate application development and leverage Notes' unique replication model as well as Notes' integrated messaging and infrastructure

* A reduced learning curve for Microsoft Visual Basic and Visual Basic for Applications programmers, offering cross-platform client/server development options and easy access to the Notes application development environment

* Integration with relational and transaction systems via the LotusScript Data Object, allowing easy access to, and integration with corporate legacy information

Rapid Application Development and Customization
LotusScript 3.0 builds on the Notes Release 4.0 application development environment by providing a consistent, easy-to-use, structured programming language in addition to the existing Notes macro language. Structured programming languages, with their support for control structures, looping

mechanisms, and data structure management, enable the development of more powerful customized solutions. A superset of BASIC, and a cross-platform language, LotusScript 3.0 will run on all Notes platforms, including IBM OS/2 Warp, Apple Mac OS, Microsoft Windows and Windows NT, and UNIX platforms including IBM AIX, Sun Solaris, HP-UX, and SCO OpenServer.

LotusScript 3.0 provides developers with an object framework that makes it easier to access and drive Notes data structures and services. Accessing and manipulating Notes objects such as databases and documents will appear logical and intuitive to developers who are experienced in object-oriented programming techniques. Coupled with the Notes distributed object store, developers can divide applications into components that can be collected, maintained, processed, reused and distributed, as well as reported on, using Notes' messaging and replication services.

Accelerating Application Development
With the introduction of LotusScript 3.0, Notes developers will gain, for the first time, a robust debugging environment for developing and testing Notes applications. Breakpoints, object inspection, flow tracing and syntax-checking capabilities will vastly improve developer productivity in the Notes environment.

LotusScript 3.0 also includes an Object Browser, which provides instant access to Notes classes and functions, variables and LotusScript language elements via drop down lists. In addition, LotusScript 3.0 provides evelopers with enhanced features such as the ability to call out to custom applications and libraries written in C.

Easy Access to Relational and Legacy Databases
The LotusScript Data Object (LS:DO) provides Notes access to relational and legacy databases via ODBC. Using LS:DO, developers can link Notes with relational databases and transaction systems directly within the Notes object framework. Because the LS:DO provides both read and write access to back-end databases, developers can build advanced Notes applications that link to external databases.

Notes Release 4.0 Offers More Application Development Flexibility
LotusScript 3.0 is one of many enhancements to the Notes Release 4.0 application development environment. Advanced programming tools include:

*Agents: Agents are Notes application logic (written in LotusScript, the Notes macro language or created from Simple Actions). They allow developers or end users to automate tasks such data handling, replication, and messaging services.

*Navigators: Navigators provide a customizable visual interface through which developers can guide users of Notes applications. Navigators consist of graphical elements combined with hotspots that allow developers to control Notes application flow. For example, a Navigator could be created to display a map of a sales territory. When the user double clicks on a city within the map, the developer can display the appropriate Notes Document and/or View for that city.

*API Enhancements: The Notes Extension Manager will support more than 60 notification events. Developers can "hook" these events, and pass control to an external process. This capability will offer system developers an unprecedented opportunity to integrate external utilities and applications with their Notes solutions, and further emphasizes Lotus' commitment to making Notes an open platform for all developers.

Improved Flexibility and Choice for Developers
Visual Basic developers will find LotusScript 3.0 easy to use since it is compatible with Visual Basic for Applications (VBA). Lotus Notes HiTest developers will welcome the common Notes Object Model, consistent with the object model in the Notes HiTest Application Programming Interfaces (APIs) for C and BASIC. Additionally, since LotusScript 3.0 will be included in Lotus' communications and forthcoming desktop applications, developers will be able to program across different applications with ease. Lotus Notes developers also can choose from a wide range of third party Lotus Business Partner programmability tools.

For more information on Lotus Notes in North America, contact Lotus at 1-800-346-1305.

Lotus Notes is the leading client-server platform for developing and deploying strategic groupware applications that help organizations communicate, collaborate and coordinate strategic business processes within and beyond their organizational boundaries to achieve improved business results. More than 5,500 companies and 1.57 million people use Notes to improve key business processes such as customer service, sales and account management, and product development. Lotus Notes supports all major operating systems including IBM OS/2 Warp, Apple Mac OS, Microsoft Windows and Windows NT, and UNIX platformsincluding IBM AIX, Sun Solaris, HP-UX, and SCO OpenServer. Notes is also available as a NetWare loadable module for the Novell environment

Lotus Development Corp. (NASDAQ: LOTS), founded in 1982, offers high quality software products and support services that reflect the company's unique understanding of the new ways in which individuals and businesses must work together to achieve success. Lotus' innovative approach is evident in a new class of applications that allows information to be accessed and communicated in ways

never before possible, both within and beyond organizational boundaries. The company now markets its products in more than 80 countries worldwide and provides numerous support services, both from its consulting division and its award-winning 24-hour support center.

EDITOR'S NOTE: All Lotus news releases are available on the Internet, via the Lotus Development Corp. Home Page at http://www.Lotus.com. The Lotus Home Page is an easy way to find information about Lotus and its business partners' products and services. A copy of this release and other company information is also available via fax by dialing 1-800-57-LOTUS within the U.S. and Canada or 201-946-2336 outside the U.S. and Canada. Questions concerning the service should be directed to Lotus' corporate communications department at 617-693-5625. All prices and terms for the US only. Lotus and Lotus Notes are registered trademarks and Notes and Lotus Word Pro are trademarks of Lotus Development Corp. cc:Mail is a trademark of cc:Mail, Inc., a wholly owned subsidiary of Lotus Development Corp. All other company and product names may be trademarks of the respective companies with which they are associated.

## News: Lotus Notes Express Now Offered with Power Macintosh Computers



*Power Macintosh Advantages Combined with the Notes Groupware Standard*

NEW YORK, New York--June 19, 1995--As part of an ongoing co-marketing and development effort between the two companies, Apple Computer, Inc. and Lotus Development Corp. today jointly announced that customers purchasing Power Macintosh computers as of today are entitled to receive, at no additional cost, Notes Express Release 3.31 for Mac OS. In addition to the standard Notes Express client, the offer includes two additional Notes Express applications and four Macintosh-specific Notes reference databases. The four reference databases have been developed especially for this offer. The Lotus Business Partners Catalog is also included.

Power Macintosh purchases as of June 19, 1995, contain a coupon redeemable for a CD-ROM disk containing the Notes Express software, online documentation, and additional software listed above. The offer is valid in the United States only.

The Power Macintosh/Notes Express offer presents a powerful, easy-to-use solution that is immediately useful to business workers who need to communicate and collaborate on a variety of critical business information even if they are only occasionally connected to a network. The version of Notes Express for Mac OS offered with the Power Macintosh combines client/server electronic mail with six of the most popular Notes applications in a ready-to-use package that enhances enterprise-wide
collaboration between all Notes users on Macintosh, Microsoft Windows, IBM OS/2 and UNIX desktops. "The success of the Power Macintosh, with more than 1.4 million units sold to date, proves the attractiveness of the RISC-based Mac platform to a broad range of customers," said Dan Eilers, Apple senior vice president for worldwide marketing and customer solutions. "By offering Notes Express with our Power Macintosh line of products, we are presenting our customers with a strong solution for advancing their communication and collaboration efforts. We are also providing them with a powerful cross-platform solution to better integrate Power Macintosh with the other major desktop and network environments in use today at both large and small organizations."

"The Power Macintosh has proven to be a serious player in enterprise computing and complements Notes as an interenterprise groupware platform," said Jeff Papows, vice president of the Lotus Communications Business Group. "Notes Express provides Power Macintosh customers with a richer set of services for communication and collaboration than simple LANs or e-mail by leveraging the

benefits of Notes backend services, including unique database replication technology, robust security, and mobile support."


Unique Applications and Databases for Macintosh
The Power Macintosh/Notes Express offer combines four of the most popular Notes groupware applications for new users plus two additional applications that increase the value of Notes Express for Power Macintosh customers.

The Notes applications include:

*Reference Document Library: View, search, and share product catalogs, technical notes, policy and procedure manuals and more.

*News Databases: Store and access the latest news, articles and other company and industry information; connect directly to newswire services via Notes.

*Shared Discussion Databases: Read and collaborate on a wide variety of documents via Notes Express. All team members have simultaneous access to the same information.

*Company Phone Book: Create a phone book complete with the extension, office location and department of each employee or customer.

*Customer Tracking Database: Keep close tabs on customers and prospects to improve account management and increase sales.

*Service Request Tracking: Monitor requests to improve response time and manage service and support department workloads. Along with the two additional applications, customers receive four Macintosh-specific Notes reference databases, developed exclusively for this offer, that can be put to use immediately, as well as the Lotus Business Partners Catalog.


The Notes reference databases are:

*AppleFacts 4.95: A concise guide to Apple products offered worldwide. AppleFacts is a convenient, one-stop reference for basic technical information, such as key product specifications, upgrade paths and accessories.

*How to Reach Apple: An on-line directory of frequently used Apple phone numbers. Included in this directory are toll-free phone numbers for customer assistance, authorized support, marketing, product information, training and more.

*Apple Solution Professionals Network: A directory of all of the members of the

Apple Solution Professionals Network (ASPN), a nationwide network of hundreds of independent consultants and systems integrators,

*Macintosh Consultants Network: A directory of all of the members of the Macintosh Consultants Network (MCN), a nonprofit, volunteer-run professional association dedicated to improving the quality of Macintosh computer consulting.

*The Lotus Business Partners Catalog: A worldwide directory listing the more than 9,000 Lotus Business Partners available to provide users with value-add products, application development and customization, systems integration, and training and support.

Additionally, an interactive, multimedia overview of Notes, developed by Apple and Lotus, is included to provide Power Macintosh users with an overview of the benefits and uses of Notes.

Notes Express is the entry-level Notes client software in the Notes family of groupware solutions for Macintosh. In addition to Notes Express, the Notes product line for the Macintosh includes Notes Desktop, a Notes run-time client that allows Notes users to run any Notes application to which they have access rights; and the Lotus Notes client, providing a proven solution for developing and deploying high-return business process applications.

The Power Macintosh/Notes Express combination is a total solution that offers an incremental, high-value way to get started with collaborative computing or to extend Notes within an organization. It also provides a straightforward trade-up path to Lotus Notes Desktop or Lotus Notes.


Systems Requirements, Pricing and Availability
Notes Express Release 3.31 for Mac OS works with all Notes Release 3.x servers, although at least one server must be Release 3.3 or later. Notes server platforms include IBM OS/2 Warp, Microsoft Windows and Windows NT, Novell NetWare Loadable Module and UNIX platforms including IBM AIX, Sun Solaris, HP-UX, and SCO OpenServer.

The offer, valid in the United States only, covers all Power Macintosh models in the 6100, 7100 and 8100 product lines, and, in the future, the Power Macintosh 9500 line announced today.

The continuing co-marketing and development effort between Apple and Lotus calls for joint product development, marketing and support for both company's complementary collaboration services, including plans by Lotus to deliver Lotus Notes Release 4 for Power Macintosh computers.

The initial agreement to offer Notes Express with Power Macintosh computers

was previously announced in January at Lotusphere 95, the second annual Lotus worldwide technical and business conference.

For the location of the nearest Apple Power Macintosh dealer, contact pple at 1-800-538-8896. For more information on Lotus Notes, contact Lotus at 1-800-346-1305.

Lotus Notes is the leading client-server platform for developing and deploying strategic groupware applications that help organizations communicate, collaborate and coordinate strategic business processes within and beyond their organizational boundaries to achieve improved business results. More than 5,500 companies and 1.57 million people use Notes to improve key business processes such as customer service, sales and account management, and product development. Lotus Notes supports all major operating systems including IBM OS/2 Warp, Apple Mac OS, Microsoft Windows and Windows NT, and UNIX platforms including IBM AIX, Sun Solaris, HP-UX, and SCO OpenServer. Notes is also available as a NetWare loadable module for the Novell environment.

Apple Computer, Inc., a recognized pioneer and innovator in the information industry, creates powerful solutions based on easy-to-use personal computers, servers, peripherals, software, on-line services, and personal digital assistants. Headquartered in Cupertino, California, Apple (NASDAQ: AAPL) develops, manufactures, licenses and markets products, technologies and services for the business, education, consumer, scientific and engineering and government markets in over 140 countries.

Lotus Development Corp. (NASDAQ:LOTS), founded in 1982, offers high quality software products and support services that reflect the company's unique understanding of the new ways in which individuals and businesses must work together to achieve success. Lotus' innovative approach is evident in a new class of applications that allows information to be accessed and communicated in ways never before possible, both within and beyond organizations boundaries. The company now markets its products in more that 80 countries worldwide and provides numerous support services, both from its consulting division and its award-winning 24-hour support center.

EDITOR'S NOTE: If you are interested in receiving Apple press releases by fax, please call 1-800-AAPL-FAX (1-800-227-5329) and enter your PIN number. If you do not have a PIN, call the Public Relations Hotline at (408)-974-2042.

EDITOR'S NOTE: All Lotus news releases are available on the Internet, via the Lotus Development Corp. Home Page at http://www.lotus.com. The Lotus Home Page is an easy way to find information about Lotus and its business partners' products and services. A copy of this release and other company information is also available via fax by dialing 1-800-57-LOTUS within the U.S. and Canada or 01-946-2336 outside the U.S. and Canada. Questions concerning the ervice

should be directed to Lotus' corporate communications department at 617-693-5625. Apple, the Apple logo and Macintosh are registered trademarks; Mac, Power Macintosh, and MacOS are trademarks of Apple Computer, Inc. Lotus and Lotus Notes are registered trademarks and Notes and Lotus Notes Express are trademarks of Lotus Development Corp. All other brand names mentioned are trademarks or registered trademarks of their respective holders and are hereby acknowledged.

## News: American Power Conversion Announces PowerNet SNMP Agent Support to Windows NT and AIX Users



*AIX and NT users given cost effective way to SNMP with PowerNet software! .*

(West Kingston, RI) American Power Conversion today announced PowerNet SNMP Agent support for Microsoft Windows NT and IBM AIX. This server based software provides SNMP connectivity for APC Uninterruptible Power Supplies at a fraction of the cost of hardware SNMP adapter approaches. In fact, when using APC UPSes with power management software, network administrators are able to get SNMP control at an additional cost of only $70 per server.

PowerNet SNMP Agent software features power alert traps, remote power monitoring, and UPS command and configuration via SNMP for APC Smart-UPS or Matrix-UPS. PowerNet SNMP Agent features power alert traps for APC Smart-UPS v/s, Back-UPS and Back-UPS Pro. In addition, PowerNet SNMP Agent provides the benefits of automatic local fileserver shutdown and local UPS management via the included APC PowerChute *Plus* package. PowerNet SNMP Agent provides the same benefits as existing hardware adapter based SNMP UPS monitoring solutions at an extremely low cost. This facilitates SNMP connection of multiple server based UPSs in user sites.

"In an enterprise network, resource loss due to power problems can take out whole LAN segments. For maximum uptime, critical resources such as servers, hubs, routers, and Digital Service Units should be protected by an SNMP-controlled UPS. PowerNet SNMP Agent provides these benefits for Netware, NT and AIX servers at a very attractive price point," said Mox Weber, APC's PowerNet Product Manager.

The benefits of PowerNet SNMP Agent for NT and AIX include:

* Remote SNMP UPS alarms warn administrators before problems happen: PowerNet SNMP Agent sends APC UPS alarm information to NMS stations via SNMP in the form of Traps. This allows remote users to be advised of critical situations affecting their network resources. The level of notification spans from the UPS warning of imminent shutdown due to low battery down to the UPS pro-actively advising that its battery needs replacing.

* Remote SNMP UPS testing saves time and money: WAN Administrators can remotely test the UPS or schedule automatic periodic battery tests via PowerNet SNMP Agent. This increases reliability through automatic battery replacement notification and eliminates the need for remote site operators.

* On-Site Configuration *not* necessary: PowerNet SNMP Agent allows remote users to set all UPS parameters via SNMP. Runtime and alarm notification behavior are definable from an NMS console, reducing the need for on-site configuration.

* Remote power monitoring, easy diagnosis: With PowerNet SNMP Agent, remote NMS users can poll the UPS for a snapshot of power conditions at the UPSs local installation. Once remote conditions have been determined, administrators can pro-actively "localize" the UPS via SNMP to fit the needs of the installation.

* Economical SNMP connectivity: Every server on a network requires a UPS with shutdown software. PowerNet SNMP Agent provides the same shutdown with the additional benefit of SNMP communications and control, at an additional cost of only $70 per server. APC's PowerNet SNMP Agent offers users SNMP power management at a fraction of the cost of existing solutions.

* Unattended system shutdown: PowerNet SNMP Agent includes APC's PowerChute *plus* software, which warns users of power problems and then automatically shuts down the system safely before the UPS battery is depleted.

In addition to standard MIB browser support, PowerNet SNMP Agent can work in conjunction with APC's PowerNet Manager products. PowerNet Manager provides a high level UPS power management GUI for HP OpenView, IBM NetView for AIX, Novell's Managewise and other popular NMSs.

SNMP based UPS control and monitoring for internetworking equipment is also available through APC's PowerNet SNMP Adapter products.

PowerNet SNMP Agent for Microsoft Windows NT and IBM AIX joins Powernet SNMP Agent for Novell Netware, originally released in late 1993. Support for other Network Operating Systems is planned in the future.

PowerNet SNMP Agent is now shipping, with a US list price for $169 for the NT version, while the AIX version has a US list price of $219.

*(All trademarks are the property of their owners)*

*American Power Conversion (NASDAQ:APCC) is the market share leader in Uninterruptible Power Supplies (UPS) and software for networks and similar mission-critical applications. Product lines include the Back-UPS, Smart-UPS, Matrix-UPS, Line-R power conditioners, PowerChute software, PowerNet SNMP adapters and software, SurgeArrest surge suppressors, and PowerManager power centers.*

*American Power Conversion is an affirmative actions/equal opportunity employer.*

## News: Plug and Play UPS for Windows 95 Integrates Power Management Software for Automatic Data Protection



*\* Microsoft licenses APC's new Back-UPS Pro as the only power protection product "Designed for Windows 95"*

*\*New PowerChute Pro software ships on every Windows 95 CD*

*\* "Multi-tasking 32-bit operating systems and apps need more protection," says UPS industry leader*

(West Kingston, RI) American Power Conversion today announced a new approach to desktop power protection with the release of the Plug and Play Back-UPS Pro. This unit is bundled with a serial communications cable that is connected to the workstation. For those users not running Windows 95, the Back-UPS Pro is also bundled with the latest version of PowerChute Pro for major OSs.

The Back-UPS Pro Workstation Bundle, which combines a new version of APC's PowerChute Pro software with Back-UPS Pro models 280, 420 and 650, is fully Windows 95 compatible and offers certified Plug and Play integration for maximum user convenience.

"Windows 95 will deliver the power of a server to millions of desktops," said Rodger B. Dowdell, Jr., President and CEO of APC. "With true multi-tasking, 32-bit power, and internet access a mouse-click away, proper power protection will be a mandatory piece of every Windows 95 environment."

Microsoft has echoed this position, specifying APC's new offering as the first power protection product officially licensed for Windows 95.

"With a host of new features for organizations such as built-in networking, a greatly improved user interface, and systems management support, Windows 95 will reduce the cost of PC ownership for organizations," said Mike Conte, Group Manager of Microsoft's Personal Systems Division. "Organizations can further ensure reliable system performance by choosing a UPS licensed to bear the Designed for Windows 95' logo."

Each copy of Windows 95 will ship with drivers for select hardware products like video cards and sound cards. The Back-UPS Pro is the only UPS with software contained on the Windows 95 CD, making Back-UPS Pro the only Plug and Play UPS on the market. Getting power management and power protection has never been easier than with the release of the Plug and Play Back-UPS Pro. The user

simply connects the Back-UPS Pro to the computer using the serial communications cable provided with the unit. Windows 95 will recognize APC's Back-UPS Pro and send prompts for the installation of PowerChute Pro, automatically completing the software installation and port configuration process.

"High performance operating systems such as Win95, Win NT, and OS/2 inherently increase the risks of data loss. Preemptive multi-tasking and built in networking increase user productivity by allowing the user to access and process more data. However, increased performance means increased data exposure. Without proper power protection, that can lead to higher costs in the event of a power fault," commented Andrew Kallfelz, APC's Back-UPS Business Unit Leader.

Back-UPS Pro lowers the cost of PC ownership through increased productivity and the elimination of power-related downtime, PC support, data loss, and the cost of power-damaged replacement components such as NIC cards, hard drives, and modems.

Most power problems that cause data loss are brief in duration, lasting a fraction of a second up to a few minutes. The Back-UPS Pro will allow the user to continue working through these outages without any data loss or downtime. In the event of an extended outage when the PC is unattended, the Back-UPS Pro will provide enough battery power for applications to auto save data before the PowerChute Pro software safely shuts down the operating system.

The PowerChute Pro software packages save the user the expense of buying separate software for power management, while ensuring compatibility with Microsoft's SMS for inventory management. Other benefits of PowerChute Pro include:

* Unattended system shutdown: PowerChute Pro warns users of power problems and in their absence automatically shuts the operating system down safely before the UPS battery is discharged.

* Scheduled system shutdown: Users can schedule daily or weekly workstation shutdown producing immediate energy savings by powering systems down safely when not in use.

* Diagnostic testing: Users can initiate a UPS self-test and diagnostic check any time.

* Power events logged in administrator/user log: Administrators can quickly detect and track power problems, which PowerChute Pro writes to an event log.

The software also can be used to diagnose both site and UPS ailments, including chronic over or under voltages or a low battery condition. The PowerChute Pro

software is installed on the system, which is then connected to a Back-UPS Pro via a serial communications cable.

In addition to supporting Windows 95, PowerChute Pro UPS monitoring software is compatible with Windows, Windows for Workgroups, Windows NT, and OS/2.

The new Back-UPS Pro models are designed specifically for multi-tasking systems such as Win NT, OS/2 and Windows 95, as well as peer-to-peer workstations, engineering workstations and other advanced networked or stand-alone systems. In addition to PowerChute Pro support, all Back-UPS Pro models feature:

* CellGuard(TM): A microprocessor-controlled, intelligent battery management system to maximize battery performance, life and reliability through fast recharge management and discharge/overcharge protection. The CellGuard system also incorporates automatic battery self-test and battery replacement alarm, so users are never surprised by a bad battery.

* User replaceable batteries: Allows users to swap expired batteries for new ones safely, easily and inexpensively. Batteries typically last 3-6 years under normal use.

* Intelligent Automatic Voltage Regulation: Uses a built-in microprocessor controlled voltage regulator to fend off extended brownouts and overvoltages without using the unit's battery, conserving backup power for full outages only.

* FAX/Modem or Network Cable Surge Protection: Built-in surge protection for telephone lines or 10BaseT network connections combined with high-performance AC surge protection ensures that the PC is protected at all surge entry points, preventing costly damage to internal components.

* Unmatched surge protection on both AC and data lines: The unit's surge protection performance is backed by a $25,000 lifetime guarantee against surge damage to protected equipment, while built-in data line protection eliminates one of the most insidious causes of data loss and hardware damage on network workstations: surges over network cabling.

The Back-UPS Pro 280, 420, and 650 with PowerChute Pro (model numbers BP280PNP, BP420PNP, and BP650PNP) will begin shipping August 15 with US list prices estimated at $239, $339 and $419 respectively. APC's Back-UPS Pro Plug and Play units will be available concurrent with Microsoft's release of Windows 95.

All 120V Back-UPS Pro models are UL and CSA approved and include a two-year warranty and $25,000 Lifetime Equipment Protection Policy.

*American Power Conversion (NASDAQ:APCC) is the market share leader in Uninterruptible Power Supplies (UPS) and software for networks and similar mission-critical applications. Product lines include the Back-UPS, Smart-UPS, Matrix-UPS, Line-R power conditioners, PowerChute software, PowerNet SNMP adapters and software, SurgeArrest surge suppressers, ProtectNet data-line surge suppressers, and PowerManager PowerCenters.*

*American Power Conversion is an affirmative action/ equal opportunity employer.*

## News: APC Unveils New Rackmounted Smart-UPS Line of Uninterruptible Power Supplies Featuring SmartSlots



*New products to protect dramatic increase in rack-mounted servers and internetworking equipment*

*SmartSlots provide industry's only "on-the-fly" customization of UPS capability*

American Power Conversion (West Kingston, RI) announces new Rackmounted Smart-UPS Uninterruptible Power Supplies with a smaller package and major enhancements to hardware performance and management functionality.

The new Rackmount Smart-UPS line is designed to provide *Performance Power Management for Advanced Business Networks*. Mounted in industry-standard 19" (or 23") racks, and offering full SNMP manageability, the new units are ideal protection for today's rackmounted networking equipment.

"Hubs, routers, and other internetworking equipment will continue to be a target market for rackmounted UPSes but the fastest growing market for these new Smart-UPS will be the increasingly popular rackmounted file servers that Compaq and other server manufacturers are introducing," said Jim Hamann, Smart-UPS Senior Product Manager.

Compatibility with today's server management products is a must for critical peripherals. All Smart-UPS products are completely compatible with server management software such as Compaq Insight Manager, IBM Netfinity, and HP NetServer Assistant.

The latest generation Smart-UPS family features SmartSlot, an internal accessory card slot for integrated UPS management. SmartSlot enables the user to customize and enhance the management, control and performance of the Smart-UPS unit. The SmartSlot and optional accessory cards offer customers convenient, seamless integration of UPS accessories. The *PowerNet SNMP Adapter* card allows the UPS to be connected directly to the network for SNMP management. The *UPS Interface Expander* card is used for multiple platform, unattended, graceful shutdown from a single UPS. Lastly, the *Call-UPS II* card provides remote, out-of-band management of the Smart-UPS over a modem.

"Imagine a rack enclosure with three file servers that are all protected by a single UPS. The UPS Interface Expander card allows one Smart-UPS to gracefully shut down all three servers even if these servers are running three different operating systems," Hamann said.

New rackmounted Smart-UPS products now available include the Smart-UPS 3000RM, 2200RM, 1400RM, 1000RM, and 700RM. The list pricing is $2679(SU3000RM), $1849(SU2200RM), $1079 (SU1400RM) $829 (SU1000RM), $649 (SU700RM). The PowerNet SNMP Adapter card, the UPS Interface Expander card and the Call-UPS II remote management card are also available with US list pricing of $399, $149, and $159 respectively.

*Additional product enhancements include:*

* *CellGuard*--Intelligent battery management provides longer battery life: Improved battery reliability results from a high precision FastCharge* battery charge system that recharges batteries 75% faster than other brands. Batteries last longer, and a proactive warning is provided before batteries wear out.

* *QuickSwap*--Hot-swappable user replaceable batteries maximize uptime: User replaceable batteries, now becoming required in the US and EC due to new environmental battery regulations, can be easily and quickly hot-swapped without powering down the connected load. Replacement battery kits ship in a reusable container for convenient and proper recycling of exhausted batteries.

* *SmartBoost*--automatically corrects brownout conditions, saves battery life: Allows the user to work through brownouts without unnecessary battery drain by boosting low voltages to a safe output level.

* *SmartTrim*--saves the battery and *automatically corrects overvoltage conditions*: Allows the user to work through overvoltages without unnecessary battery drain by trimming high voltages to a safe output level.

*Standard benefits of the Smart-UPS line include:*

* *Line Interactive design*--Delivers unmatched performance and reliability: An innovative line interactive design uses the DC to AC power inverter "in reverse" as a battery charger during normal operation providing greater performance, filtering and efficiency. Fewer components under stress loads result in greater reliability than inefficient double conversion on-line UPS.

* *Network Interface*--Adds automatic safe shutdown: When used in conjunction with APC's PowerChute plus UPS monitoring software the Smart-UPS have bi-directional communications to coordinate a safe shutdown across all major operating systems and to provide UPS management and control

* *Lightning and surge suppression*--Shields hardware: UL 1449 rated for maximum surge protection. In addition, a transient voltage surge suppression ground is provided for eliminating inter-system ground problems.

*Network-grade line conditioning*--Prevents glitches: Full time EMI/RFI filters

prevent line noise from causing data errors, meeting Novell's approval for network protection without the need for additional external conditioners.

The Smart-UPS line has a 2 year warranty and a $25,000 Lifetime Equipment Protection Policy which repairs or replaces properly connected equipment in the case of a surge due to lightning. The Smart-UPS line is UL, CSA, and VDE approved.

*American Power Conversion (NASDAQ:APCC) is the market share leader in Uninterruptible Power Supplies (UPS) for networks and similar mission-critical applications. Product lines include the Back-UPS, Smart-UPS, Matrix-UPS, Line-R power conditioners, PowerChute software, PowerNet SNMP adapters and software, and SurgeArrest surge suppressors.*

*American Power Conversion is an affirmative action/ equal opportunity employer.*

*All trademarks are property of their owners.*

# News: APC Announces the Control-UPS/400, Advanced UPS Control and Diagnostics for AS/400 Systems



*APC's Control-UPS/400: the only power protection product to provide advanced UPS control in an AS/400 environment.*

(West Kingston, RI) Administrators working in AS/400 environments have been given new options for power management with the release of Control-UPS/400 by American Power Conversion. Control-UPS/400 combines APC's PowerChute/400 software with the Control-UPS/400 hardware to shutdown and completely manage a UPS connected to AS/400 systems. Used in conjunction with APC's Smart-UPS or Matrix-UPS, Control-UPS/400 provides not only basic UPS monitoring and graceful unattended shutdown, but also scheduled shutdown and testing, user notification of power events, as well as complete power management of the AS/400 environment. Control-UPS/400 supports all AS/400 systems running OS/400 V2R3 and higher.

The Control-UPS/400 kit is installed on the AS/400 system, which is then connected to a Smart-UPS or Matrix-UPS via a serial communications cable.

The Control-UPS/400 hardware interface provides for advanced UPS control via PowerChute plus on a separate PC (may be running OS/2, Windows, or other OS) or a terminal using a powerful menu driven, character based interface. Using Control-UPS/400 users are able to support not only the AS/400 but also complementary client server systems like Novell, OS/2 and NT. This level of UPS communication and control was previously unavailable in AS/400 environments.

PowerChute/400 software offers the following features including; safe automatic shutdown, power problem tracking, user notification on power events and power loss, and system reboot when power returns. These features are unavailable using the AS/400 port.

"Until now, AS/400 users had to settle for basic system shutdown. Control-UPS/400 provides better security, improved power management, as well as multiple OS support.", commented Vincent Giordano, PowerChute Product Manager. Giordano added, "For the first time AS/400 system administrators have complete UPS management for their entire AS/400 network."

The benefits of the Control-UPS/400 include:

* Unattended system shutdown: Control-UPS/400 alerts AS/400 users of power problems when they occur. Control-UPS/400 automatically shuts the system down safely before the UPS battery is discharged.

* Scheduled system shutdown: Users can remotely schedule daily or weekly workstation shutdown. This translates into immediate energy savings by powering systems down safely when not in use. It also improves security since the AS/400 is completely turned off after the automatic scheduled shutdown, allowing no unauthorized access. The system is automatically restarted at the scheduled wakeup time.

* Diagnostic testing: Users can remotely initiate a UPS self-test and diagnostic check any time, ensuring the health of their UPS without ever needed to go travel to the UPS. Important self tests will no longer be forgotten since it is automatically performed saving support costs.

* Remote UPS management: The AS/400 administrator can remotely manage the APC UPS via modem or remote client giving complete control over the UPS at any time.

* Environment and power monitoring: Administrators can quickly detect and track power problems monitored by the Control-UPS/400 to determine the quality of the site's power. In addition, Control-UPS/400 works in conjunction with other APC accessories such as Measure-UPS (TM) to track temperature levels and humidity of the UPS. AS/400 systems operating in a "glass house" environment can constantly monitor temperature and humidity levels. This allows administrators to be warned of potential environmental hazards.

The Control-UPS/400 can also be used to diagnose both site and UPS ailments, including chronic over or under voltages, and low battery conditions.

*The Control-UPS/400 which ships June 1, 1995 will have a US list price of $399.*

*American Power Conversion (NASDAQ:APCC) is the market share leader in Uninterruptible Power Supplies (UPS) and software for networks and similar mission-critical applications. Product lines include the Control-UPS/400, Back-UPS, Smart-UPS, Matrix-UPS, Line-R power conditioners, PowerChute software, PowerNet SNMP adapters and software, SurgeArrest surge suppressors, ProtectNet data-line surge suppressors, and PowerManager PowerCenters.*

*American Power Conversion is an affirmative action/ equal opportunity employer.*

*(All trademarks are the property of their owners)*

## News: AST Research to Integrate McAfee ANti-Virus Technology into Bravo and Premmia Business Desktops



*ROMShield Provides Desktop Users First Line of Defense Against Computer Viruses*

SANTA CLARA, Calif. (May 15, 1995)--McAfee (NASDAQ: MCAF) announced today that AST Research Inc. (NASDAQ: ASTA), the world's sixth largest PC manufacturer, has licensed key anti-virus technology from McAfee. Effective immediately, AST will begin shipping Bravo and Premmia 100 Mhz Pentium desktop systems protected by McAfee's ROMShield anti-virus firmware.

McAfee's technology plays a leading role in the AST-CommandCenter utility package, also announced today by AST, which provides AST desktop users advanced security and system management capabilities. Under the terms of the licensing agreement with AST, McAfee has provided customized versions of its ROMShield anti-virus firmware, which prevents against boot virus infections.

"AST is pleased to arm our business desktop users with McAfee's industry-leading virus protection as part of AST-CommandCenter," said Scott Smith, AST's vice president and general manager, desktops. "Our relationship with McAfee is part of our overall strategy to lower the cost of PC ownership for our corporate customers and end-users."

"We applaud AST for taking proactive and decisive steps to protect their customers from viruses," said Rick Kreysar, vice president of marketing at McAfee, based in Santa Clara, Calif. "By utilizing McAfee's industry-leading anti-virus firmware and software technology, AST-CommandCenter provides users with a solid first line of defense against computer viruses."

ROMShield Prevents Boot Virus Infections
According to National Computer Security Association estimates, boot viruses account for only about 10% of all known viruses, yet are responsible for 86% of actual virus infections. Well-known boot viruses include Monkey, Form, Michelangelo, and Stoned. The most common cause of boot virus infection is when users accidentally boot their computer from an infected floppy disk. AST addresses the boot virus threat by incorporating McAfee's ROMShield firmware into upgradeable FlashROM chips on Bravo and Premmia motherboards.

The reason boot viruses are so prolific is that boot viruses infect during the boot process and before the operating system and anti-virus defenses have been

loaded. No anti-virus software package on the market today is capable of preventing boot virus infections during the boot process.

ROMShield prevents boot virus infection by installing itself as extended BIOS before the system accesses the boot and master boot record (MBR) of the system disk, which is where boot viruses lurk. With ROMShield activated in memory, the system can detect the presence of boot viruses hiding within the MBR and boot sector. Once a virus is detected, ROMShield suspends the boot process and allows the administrator to take action.

AST is the first PC vendor to ship ROMShield-enabled systems. Although this represents McAfee's first desktop systems deal, ROMShield has already established itself as the leading anti-virus firmware solution for Ethernet network adapters. ROMShield is now readily available from leading Ethernet NIC card vendors such as 3Com, Microdyne/Eagle, and SMC. These vendors collectively hold over 50% of the network adapter market.

In addition to shipping pre-configured with ROMShield, the AST systems also ship pre-loaded with VShield, McAfee's TSR technology than scans for over 5,000 known and unknown viruses. While ROMShield with VShield provides a formidable deterrent against computer viruses, they are not intended as a replacement for traditional anti-virus scanning, cleaning, and removal software.

Founded in 1989, McAfee is a leading vendor of Network Security & Management products for the PC LAN market. Its product line is comprised of award-winning client/server applications including anti-virus, asset management, metering, electronic software distribution, Windows Desktop Management, print management, help desk and remote control software products. The company's products are distributed electronically through its own World Wide Web server (www.mcafee.com), Internet (mcafee.com), its HomeBase on-line service (408-988-4004), CompuServe (GO MCAFEE), America Online (MCAFEE), through computer resellers, and through a unique worldwide network of 152 authorized agents in 60 countries who provide local sales and technical support. The company is headquartered in Santa Clara and maintains a sales and product development office in Tinton Falls, New Jersey. McAfee's general sales number is (408) 988-3832.

## News: McAfee Debuts BrightWorks™ 2.0; Gains New Server Monitoring, Performance Tuning, Help Desk, Scripting, and Enterprise Metering



*McAfee Unveils Strategy to Create Industry's First True Integrated Enterprise Network Management Suite*

NETWORLD+INTEROP, LAS VEGAS, NV (March 28, 1995)--McAfee (NASDAQ: MCAF) today released BrightWorks 2.0, an integrated enterprise network management suite for NetWare 3.x and 4.x networks. The suite gains new server monitoring, server performance tuning, help desk, and advanced scripting modules. The product's enterprise metering, inventory, and software distribution capabilities have also been enhanced.

Combined with add-on support for remote control and anti-virus modules, BrightWorks 2.0 provides network administrators the broadest integrated enterprise-wide Network Management solution for PC networks. The BrightWorks suite, which includes two years of free updates and support, is priced at one half the cost of competing suite solutions from vendors such as Intel and Symantec.

"BrightWorks 2.0 has entered the next stage of its evolution, and is now ideally positioned to meet the dynamic needs of small businesses, government agencies, and large multi-national corporations," said Rick Kreysar, McAfee vice president of marketing. "With its broad range of scaleable modules, BrightWorks 2.0 is the only integrated network management suite capable of meeting the network management requirements of both small LANs and enterprise WANs."

The next stage in the evolution of BrightWorks will arrive by late summer when McAfee introduces BrightWorks 3.0. BrightWorks 3.0 will provide the following four critical requirements for enterprise PC management: Complete multi-server support; full WAN-enabled TCP/IP protocol support; a centralized SQL data repository; and full SNMP-enabled Unix integration with HP Openview, IBM NetView, and Sunsoft's SunNet Manager.


*New!*        NetTune™ Server Monitoring and Performance Tuning
The new NetTune module, which incorporates technology licensed from HawkNet, Inc., allows administrators to monitor server attributes and tune server performance. NetTune maps memory, creates graphical reports for over 100 set parameters, and monitors server configuration. The software monitors activity in seven key areas including LAN parameters, connections, SET parameters, volumes, and NLMs.

NetTune can also increase server performance by up to 25%. To accomplish this feat, NetTune monitors server utilization patterns and makes automatic, real-time adjustments to over 60 set parameters. Server utilization pattern information is consolidated into a historical database of fileserver activity so that BrightWorks can automatically predict, diagnose, and respond to network and fileserver activity.

The NetTune module also allows administrators to configure BrightWorks to perform application-specific tuning. For example, to speed network backups and increase network availability, BrightWorks can automatically change tuning parameters when backup applications are run and then reset parameters when backups are finished. Administrators can also manually adjust set parameters from the BrightWorks console.


*New!* Built-in Help Desk With LAN Support Center™
According to analyst estimates, a large portion of the cost to manage network assets relates to user support. To address this critical support requirement, McAfee has integrated their popular help desk, LAN Support Center, into the BrightWorks 2.0 management console.

"The world of network management technology continues to consolidate functionality at a rapid pace," said Bob Johnson, director and principal analyst for software services at Dataquest in Framingham, MA. "Customers win as they gain new feature combinations they use everyday across software/hardware asset management, help desk tools and systems management capabilities."

LSC helps administrators automate the collection, tracking and analysis of end-user support requests. LSC's flexible database allows administrators to custom-tailor screen layout for simplified data tracking. The database also makes it simple for administrators to quickly access past solutions to common problems. Powerful reporting capabilities allow administrators to track help desk effectiveness and ensure that user support requirements are being met.

LSC and LAN Inventory share a common inventory database, allowing administrators to access inventory information from within LSC. LSC also supports full client/server integration with HelpPlus, McAfee's client-side trouble ticket generator. HelpPlus users can automatically transfer trouble-tickets into the LSC database for faster troubleshooting.


*New!* Powerful Scripting with PowerScript™ Enhances ESD
PowerScript, a new high-end Visual Basic-like scripting language with full network extensions, offers administrators centralized control over a wide range of network operating parameters and increased software distribution flexibility.

PowerScript frees administrators from having to perform repetitive tasks. Using the Powerscript macro recorder, for example, administrators can perform a task once, automatically capture the task steps in a self-generating script, and then play out the script across the enterprise. The administrator can also perform routine file maintenance tasks using Powerscript scripts that are automatically activated at startup, as scheduled events, or from icons.

While PowerScript is a powerful administrator's tool, it also insulates users from the complexities of today's enterprise-wide network. For example, when a user selects a program item from their desktop menu, a Powerscript script can transparently attach the user to file servers, map drives, change paths on-the-fly, and check network membership and log-in rights.

PowerScript complements BrightWorks' present QuickScript™ scripting capability. QuickScript is designed for users who want to quickly produce sophisticated and flexible scripts without programming.


*Improved!*        Enterprise-wide Software Metering and Monitoring
BrightWorks now integrates McAfee's SiteMeter™ 5.0 metering software. SiteMeter 5.0, which was recently named Product of the Year by LAN Magazine, is the industry's first enterprise software metering and monitoring package to support TCP/IP.

By allowing organizations to share or "float" software licenses across local and wide area links, BrightWorks customers can transcend traditional geographic software licensing boundaries and limitations. Using the data and reports provided, network administrators can base purchase decisions on actual concurrent usage as opposed to the number of seats. One early SiteMeter customer, Household Credit Services, of Salinas, CA, estimates SiteMeter will help it reduce its enterprise-wide Microsoft Office license expense by $800,000 in the next two years alone.

The SiteMeter 5.0 module consolidates multi-server metering and reporting under a centralized administration console, allowing administrators to easily view and manage global application usage. Its flexible reporting capabilities generate a variety of easily produced SPA-approved reports to demonstrate license compliance in the event of an audit. An agentless metering feature allows BrightWorks to meter applications across the enterprise without requiring a TSR.


*Improved!*        Software Inventory Improved
The BrightWorks LAN Inventory™ module, which automates the collection, consolidation, analysis, and reporting of LAN asset information, has been upgraded to version 3.2. Announced March 8, the module provides full support

for Compaq's Intelligent Manageability strategy, as well as several new capabilities designed to help network administrators track and manage distributed PC assets.

The LAN Inventory 3.2 module incorporates new technology designed to improve the product's already strong recognition rates for software packages installed on the desktop and server. Other LAN Inventory 3.2 enhancements include consolidated reporting options, an enhanced user interface, flexible scheduling of audit times, 25% faster audits, improved security during audits, and the ability to recognize flawed Intel Pentium chips. LAN Inventory integrates with McAfee's software distribution module, allowing administrators to perform distribution tasks based on inventory data.

*Improved!*      Reporting
McAfee has enhanced the reporting module of BrightWorks 2.0. The module now features an enhanced visual interface for designing reports while viewing live data, allowing for faster, more interactive report design. The reporting module also provides extended and simplified database access. Cryptic database file names have been replaced with intuitive field names and formulas.

Pricing, Support, and Availability
McAfee backs its products with the industry's most comprehensive upgrade and support policies. Under McAfee's unique software licensing model, BrightWorks customers receive two years of free upgrades and unlimited live telephone support. This level of comprehensive product maintenance and support costs 50% less than suite solutions from competing vendors such as Intel and Symantec, who charge extra for product upgrades and support.

Two year subscription fee pricing for BrightWorks 2.0 ranges from $42.00 per node for 50 nodes to $25.50 per node for 1000 licenses. Existing BrightWorks 2.0 customers can upgrade to version 3.0 at no additional cost.

BrightWorks 2.0 begins shipping through electronic channels this week. The product will be available through retail channels on April 3. Electronically distributed versions are identical to shrink wrap versions, and contain no time-bombs or encryption.

Founded in 1989, McAfee is a leading vendor of Network Security & Management products for the PC LAN market. Its product line is comprised of award-winning client/server applications including anti-virus, asset management, metering, electronic software distribution, Windows Desktop Management, print management, help desk and remote control software products. The company's products are distributed electronically through its own World Wide Web server (www.mcafee.com), Internet (mcafee.com), its HomeBase on-line service (408-

988-4004), CompuServe (GO MCAFEE), America Online (MCAFEE), through computer resellers, and through a unique worldwide network of 152 authorized agents in 60 countries who provide local sales and technical support. The company is headquartered in Santa Clara and maintains sales and product development offices in Tinton Falls, New Jersey.

# News: McAfee NetShield 2.2 and VirsuScan 2.2 Anti-Virus Achieve Over 97% Detection Rate; Functionality Extends Enterprise Protection

SANTA CLARA, Calif. (May 1, 1995)--McAfee (NASDAQ: MCAF) today introduced NetShield 2.2 for NetWare and VirusScan 2.2 for DOS, Windows and OS/2. The new releases provide faster scanning performance, improved ease-of-use, stronger manageability, and maximum virus detection. New features include better integration between the applications, Novell NetWare 4.1 support, enhanced notification options, a new Windows console, administrator access controls, and increased scanning and detection performance.

"The three overriding customer virus concerns are detection, removal and support," said Scott Gordon, McAfee's Anti-Virus Product Manager. "According to IDC, VirusScan holds a 67% marketshare for desktop anti-virus software. As the best-selling vendor, our large worldwide installed base enables us to discover and eradicate new virus threats before they become widespread. Combined with our pioneering expertise in virus research, McAfee customers can be assured of a swift and decisive response to their virus infections. In order to provide our customers the finest virus protection and enterprise manageability, we plan to extend the platform support of our award-winning solutions to include Windows NT and Windows 95."

Improved Enterprise Manageability and Control
McAfee makes it easier for administrators to manage and maintain current anti-virus protection across the enterprise. NetShield 2.2 and VirusScan 2.2 now share a common virus scanning engine and library, enabling network managers to employ only one set of monthly updated files. A new NetShield Windows console delivers point and click convenience to streamline administrator tasks. Utilizing Novell's NetWare Directory Services (NDS) in NetWare 4.1, network administrators can easily view and configure multiple NetShield servers. NetShield's cross-server updating feature also takes advantage of NDS to automatically synchronize virus signature updates.

NetShield has expanded its virus alerting options to provide users immediate notification of new and suspected network virus infections. The notification options, which include pager, console, network broadcast, and Global Message Handling Services (GMHS), allow administrators to quickly respond to virus threats. The support for GMHS enables NetShield to broadcast alerts through popular e-mail programs such as Lotus Development's cc:Mail.

NetShield features a new management module that allows network administrators to create hierarchical password and access privilege rights for individual LAN administrators within enterprise environments. This module was created in response to demands by McAfee customers within distributed, multi-server networks who required more in-depth administrator access controls. The unique feature further enhances NetShield's safeguards and better enforces corporate security.


Scanning Performance and Virus Detection Improved
The new VirusScan engine allows NetShield to perform scans up to 500% faster than previously possible. This makes daily virus prevention tasks less intrusive on server resources and end users, and was accomplished by incorporating new technology that executes more efficient scans while reducing server CPU utilization. The new scanning algorithms also ensure highly accurate virus identification. NetShield and VirusScan use a combination of byte string scanning, wildcard scanning, emulation, heuristic analysis, filtering and checksumming techniques.

Static anti-virus products are inadequate against the more than one hundred new viruses introduced each month. McAfee engineers and virus researchers bolster the detection capabilities of NetShield and VirusScan monthly, providing McAfee customers the electronic equivalent of an immune system booster shot for their enterprise network defenses.

In March, Patricia Hoffman's Virus Information Summary Listing (VSUM1) reported that both best-selling McAfee products scored virus detection rates exceeding 97%, higher than any other products in their class. Presently, McAfee identifies over 5,000 known and unknown viruses, including: Boot sector; file; encrypted; polymorphic; mutation engine; stealth; multi-partite; and parasitic viruses. Monthly updates, unlimited live telephone support, and emergency virus response services are provided free to McAfee subscribers for two years.


Integrates with BrightWorks Network Management Suite
NetShield 2.2 now integrates directly into the administration console of McAfee's award-winning BrightWorks 2.0 network management suite for NetWare LANs. BrightWorks, which features help desk, asset management, license metering, software distribution and network monitoring modules, provides network administrators a completely integrated network management environment.


VirusScan for Windows 95 In Development
McAfee builds client-driven products and strives to provide the most advanced virus detection and removal technology to a broad range of PC-based platforms. Throughout the year, McAfee will introduce new anti-virus products and updates,

as well as further integration between NetShield and VirusScan. In the third quarter, McAfee will introduce VirusScan for Windows 95. VirusScan for Windows 95 is a native application that will integrate and take advantage of the Windows 95 operating system. Current McAfee VirusScan subscribers who intend to migrate to Windows 95 will receive a pro-rated credit of up to 80% of their purchase price for the new product.

Pricing, Support, and Availability
McAfee backs its products with the industry's most comprehensive upgrade and support policies. Under McAfee's unique software licensing model, customers receive two years of free upgrades and unlimited live telephone support. This level of comprehensive product maintenance and support costs 50% less than anti-virus solutions from competing vendors, who often charge extra for product upgrades and support.

NetShield is priced based on the number of network nodes. Two year subscription fee pricing for NetShield 2.2 ranges from $18.00 per node for a 25 node network to $6.12 per node for 2,500 nodes. VirusScan pricing ranges from $65 for a single user to $12.40 per node for 2,500 users. Current NetShield and VirusScan subscribers can update to the new versions at no cost.

VirusScan 2.2 is now shipping through retail and electronic channels. NetShield 2.2 will begin shipping on June 1. Electronically distributed versions are identical to shrink wrap versions, and contain no time-bombs or encryption.

Founded in 1989, McAfee is a leading vendor of Network Security & Management products for the PC LAN market. Its product line is comprised of award-winning client/server applications including anti-virus, asset management, metering, electronic software distribution, Windows Desktop Management, print management, help desk and remote control software products. The company's products are distributed electronically through its own World Wide Web server (www.mcafee.com), Internet (mcafee.com), its HomeBase on-line service (408-988-4004), CompuServe (GO MCAFEE), America Online (MCAFEE), through computer resellers, and through a unique worldwide network of 152 authorized agents in 60 countries who provide local sales and technical support. The company is headquartered in Santa Clara and maintains a sales and product development office in Tinton Falls, New Jersey.

1 Patricia Hoffman's VSUM service is widely recognized for the rigorous and independent testing it performs on third party anti-virus applications each month. The results of these tests are published electronically in the VSUM report, which also contains a hypertext database of all known viruses. The report is distributed as shareware and can be downloaded at (408) 244-0813.

## News: McAfee Introduces LAN Inventory 3.2; Provides Support for Compaq's Intelligent Manageability Strategy and Features for Simplified Asset Management



*LAN Inventory Helps Slash the Cost of LAN Ownership*

SANTA CLARA, Calif. (March 8, 1995)--McAfee (NASDAQ: MCAF) today debuted LAN Inventory 3.2, a new version of its industry-leading asset management package for NetWare 3.x and 4.x LANs. The package combines comprehensive support for Compaq's Intelligent Manageability Strategy with several new capabilities designed to help network administrators track and manage distributed PC assets.

According to Gartner Group, the cost to purchase an average desktop PC is $4,000, yet the cost to operate and manage that PC over five years increases ten-fold to $40,000. LAN Inventory 3.2 addresses these cost-of-ownership concerns by providing network administrators tools to automate the collection, consolidation, analysis, and reporting of LAN asset information.

LAN Inventory 3.2's support for Compaq's Intelligent Manageability Strategy simplifies the administration of Compaq's new line of Deskpro PCs. Utilizing LAN Inventory's improved Window 95-like interface, administrators can track key characteristics of the Deskpro line, including asset tag information, ROM revision date, system board revision level, model name, system chassis serial number, hard drive make and model, and PC monitor attributes such as model, manufacture date, and serial number.

"We're pleased that Compaq is working with McAfee to ensure the manageability of their PCs," said Bill Larson, president and CEO of McAfee. "Compaq's Intelligent Manageability Strategy will be well-received by network administrators who are struggling to manage their desktop hardware and software assets. We hope other desktop systems manufacturers will follow Compaq's precedent-setting lead in recognizing the importance of desktop management."

"We're pleased to have McAfee as a valued member of our Desktop Management Solutions Partners program," said Kevin Bohren, vice president, desktop marketing, Desktop Product Division, Compaq Computer Corporation. "Together, Compaq and McAfee are working to provide products that significantly lower the cost of ownership of networked PCs. We value McAfee's expertise in asset management and look forward to working with them in the future to bring additional exciting Intelligent Manageability features to the desktop."

In addition to supporting Compaq's Intelligent Manageability Strategy, LAN Inventory 3.2 provides new technology designed to improve the product's already strong recognition rates for software packages installed on the desktop and server. McAfee plans to offer free electronic updates of the LAN Inventory detection database on a quarterly basis (see final paragraph of release for download sites and addresses).

Other new LAN Inventory 3.2 enhancements include consolidated reporting options, flexible scheduling of audit times, 25% greater performance, and the ability to recognize flawed Intel Pentium chips.

LAN Inventory automatically builds and updates a database of over 60 different network, fileserver, and desktop attributes. Comprehensive reporting options allow administrators to analyze large quantities of data and maintain an up-to-date status of LAN assets and asset changes. This information can be used for network planning, resource allocation, and growth projections.

Asset Management Components

Inventory software is just one component in a network administrator's asset management toolbox. Other asset management tools now reaching widespread deployment include Metering software, which monitors software usage and license compliance, and Electronic Software Distribution (ESD) software, which automates distribution of software updates across the network. McAfee offers award-winning products in each of the above categories. For metering, McAfee offers SiteMeter 5.0. McAfee offers ESD functionality in its BrightWorks integrated Network Management package, which also includes LAN Inventory 3.2 and SiteMeter 5.0. A new version of BrightWorks will be announced at NetWorld+Interop the week of March 27.

Pricing and Availability

Two year subscription fee pricing for LAN Inventory 3.2 ranges from $10.00 per node for 50 nodes to $8.00 per node for 1000 licenses. All McAfee customers are entitled to two years of free updates--both major and minor--and free unlimited telephone support. Current licensed LAN Inventory users can upgrade to LAN Inventory 3.2 at no cost.

LAN Inventory 3.2 begins shipping through electronic channels on March 10, 1995. The product will be available through retail channels on March 17. Electronically distributed versions are identical to shrink wrap versions, and contain no time-bombs or encryption.

Founded in 1989, McAfee is a leading vendor of Network Security & Management products for the PC LAN market. Its product line is comprised of award-winning client/server applications including anti-virus, access-control,

asset management, metering, electronic software distribution, print management, help desk and remote control software products. The company's products are distributed electronically through its own World Wide Web server (www.mcafee.com), Internet (mcafee.com), its HomeBase on-line service (408-988-4004), CompuServe (GO MCAFEE), America Online (MCAFEE), through computer resellers, and through a unique worldwide network of 152 authorized agents in 60 countries who provide local sales and technical support. The company is headquartered in Santa Clara and maintains sales and product development offices in Tinton Falls, New Jersey.

## News: McAfee Introduces NetRemote™ 6.0; Agressively Priced Remote Control and Remotte Access Software for Standalone and Networked PCs



*McAfee Establishes New Price/Performance Benchmark for Remote Control Category by Pricing NetRemote 67% Below Symantec's pcANYWHERE*

SANTA CLARA, Calif. (April 10, 1995)--In a bold move to expand its presence in the rapidly growing remote control software market, McAfee (NASDAQ: MCAF) today introduced NetRemote 6.0. With its aggressive street price of $49.95, NetRemote 6.0 establishes a new price/performance benchmark in a category now dominated by Symantec's pcANYWHERE. This low price-point will help expand the total market by making powerful remote communications capabilities affordable for all mobile workers.

"NetRemote 6.0 is an ideal remote communications solution for traveling or telecommuting users with the need to seamlessly access and control the host resources of another standalone or networked PC," said Rick Kreysar, vice president of marketing at McAfee. "The product combines the advanced features and scaleability demanded by network administrators with the ease-of-use and price-point demanded by remote end-users."

By standardizing on a single product that scales from administrator to mobile user, NetRemote customers can reduce the support cost of remote control across the enterprise. With the addition of new features and improved ease of use, NetRemote 6.0 has extended its franchise from being a power tool for network administrators to a general purpose remote communications tool for the entire enterprise. NetRemote's aggressive price-point ushers in a new era of affordability for end-users of remote communications software.

Innovative New Features Place NetRemote at the Top of its Class
NetRemote 6.0 ships complete with host and remote nodes and is packed with innovative features that place it at the top of its class. Many of the features are designed to help insulate users from the complexities of remote communication sessions.

Among major competitors, NetRemote is the first remote control product to provide bi-directional drive mapping. This technology makes it possible for host and remote PCs to seamlessly share data and execute programs from either PC, regardless of which PC actually holds the data or files being accessed. Most remote control products only allow the remote user to map host drives, and not

vice versa.

Another unique feature is NetRemote 6.0's true color support for 16-bit (64,000) and 24-bit (16,000,000) colors. True color support allows NetRemote to support the widest range of screen resolutions, and ensures that host and remote screen displays are automatically translated during connections to match the highest common screen resolutions.

Other new features include drag and drop file transfers; enhanced security options such as dial-back connections, file transfer restrictions linked to individual users and directories, screen blanking, keyboard locking and log-in restrictions; network support for IPX/SPX and NetBIOS; simultaneous multi-protocol remote connections; remote mouse and keyboard support; and remote printing.

### NetRemote 6.0 Sets New Price/Performance Benchmark in Remote Control

|  | McAfee NetRemote 6.0 | Symantec The Norton pcANYWHERE for Windows 2.0 | Microcom Carbon Copy for Windows 2.5 |
| --- | --- | --- | --- |
| List price | $65.00 | $199.00 | $199.00 |
| Estimated street price | $49.95 | $120.001 | $130.001 |
| Bi-directional drive mapping | Yes | No | No |
| True 16 million color support | Yes | No | No |
| Intuitive install-- automatically configures modem | Yes | Yes | No |
| Re-directed printing | Yes | Yes | No |
| Network support | Yes | Yes | Yes |

1Symantec and Microcom street prices from 2/20/95 InfoWorld

Integrates with BrightWorks for Remote Support
NetRemote integrates directly into the administration console of McAfee's award-winning BrightWorks 2.0 network management suite for NetWare LANs, making NetRemote an ideal solution for network administrators and help desk personnel who need to provide remote support to their users. BrightWorks, which features help desk, asset management, license metering, software distribution and network monitoring modules, provides network administrators an integrated network support environment that makes valuable information easily accessible during remote support sessions.


NetRemote Channel Promotions
McAfee plans to support the launch of NetRemote 6.0 with aggressive end-cap channel promotions, direct mailings, advertising in trade publications, and co-op advertising with catalog retailers. End-cap promotions will begin at 83 CompUSA stores nationwide in May, with promotions at other major regional and nationwide retailers to follow. The product will be distributed by Ingram and Tech Data.


Pricing and Availability
NetRemote is based largely on award-winning technology licensed from Triton Technologies Inc. NetRemote 6.0 carries a suggested retail price of $65.00 and an anticipated street price of $49.95. Two year site license subscription fee pricing for NetRemote 2.0 ranges from $48.00 per node for 50 nodes to $20.50 per node for 1000 licenses. All McAfee customers are entitled to two years of free updates--both major and minor--and free unlimited telephone support. Current licensed NetRemote subscribers can upgrade to NetRemote 6.0 at no cost.

NetRemote 6.0 begins shipping through electronic channels this week. The product will be available through retail channels on April 17. Electronically distributed versions are identical to shrink wrap versions, and contain no time-bombs or encryption.

Founded in 1989, McAfee is a leading vendor of Network Security & Management products for the PC LAN market. Its product line is comprised of award-winning client/server applications including anti-virus, asset management, metering, electronic software distribution, Windows Desktop Management, print management, help desk and remote control software products. The company's products are distributed electronically through its own World Wide Web server (www.mcafee.com), Internet (mcafee.com), its HomeBase on-line service (408-988-4004), CompuServe (GO MCAFEE), America Online (MCAFEE), through computer resellers, and through a unique worldwide network of 152 authorized agents in 60 countries who provide local sales and technical support. The company is headquartered in Santa Clara and maintains sales and product

development offices in Tinton Falls, New Jersey.

# News: McAfee Introduces NetTools® 5.2; Simplifies Enterprise-wide Windows Desktop Management With New Global Features



*Offers Native Support for NetWare Directory Services*

SANTA CLARA, Calif. (February 17, 1995)--McAfee (NASDAQ: MCAF) today announced that NetTools, its Windows Desktop Management solution, will gain improved global management capabilities. Scheduled to ship March 15, NetTools 5.2 will add native NetWare Directory Services (NDS) support for NetWare 4.x networks, as well as additional global management capabilities for NetWare 3.x networks.

First introduced in 1989, NetTools is the defacto standard in Windows Desktop Management. NetTools includes five integrated modules designed to automate a network administrator's most tedious and time consuming tasks. These modules include AppMan™ for menu administration, Print Manager™ for printer management, the DCL™ scripting language module for software distribution and application deployment, IniTool™ for Windows .ini file management, and Secure Station™ for desktop security and access control. Of these modules, AppMan, Print Manager, and DCL will directly benefit from native NDS support.

"With the advent and stability of NetWare 4.1, Novell has proven itself in the enterprise arena," said Rick Kreysar, vice president of marketing at McAfee. "Since NetTools appeals to large organizations who tend to be enterprise in scope, we've seen a ground swell of demand for NDS support now that NetWare 4.1 is entering widespread enterprise deployment."

"We're extremely pleased that McAfee has chosen to incorporate native NDS support into NetTools," said Scott Wells, senior manager of ISV Marketing Programs at Novell, Inc. "NetTools 5.2 is an excellent example of how enterprise network administrators can maximize the flexibility of NetWare 4.x by leveraging NDS to simplify tedious and time consuming Windows Desktop Management chores."

NetTools users in NetWare 3.x environments will also gain improved global management capabilities. Previously, NetTools allowed administrators to set application rights and privileges on a server by server basis. With NetTools 5.2, administrators can now assign global rights to program group files. The files, called "APP" files, contain a complete set of icons for each desktop, based on the restrictions placed on the user's group.

AppMan Gains Global End-User Menu Administration (NetWare, NT Server)

The NetTools Application Manager (AppMan™) uses pre-established network group rights and privileges to build and define each user's desktop. Now that NetTools supports NDS, administrators can assign and restrict application privileges based on any user object contained in the NDS directory tree.

Through AppMan, each desktop displays only the applications and icons needed by each user. AppMan effectively replaces the Windows Program Manager with a Windows-compatible interface. This capability negates the need for additional end-user training and provides administrators complete centralized control.


Global Print Management (NetWare)
The NetTools print manager makes global network printing simple and hassle-free for users and administrators. For administrators, NetTools provides complete network-wide printer configuration management and control. One unique NetTools feature is its automated printer management facility that allows administrators to remotely assign printer rights through a print list.

The NetTools print manager allows administrators to configure each network printer's queue, driver, and Windows printing options once and make them available to selected groups of network users and selected groups from the NDS directory tree. To help users help themselves and minimize printing-related support duties, administrators can create printer-specific help files for such tasks as label alignment and toner cartridge replacement.

Users are provided simplified access to printers by location, type, and description. NetTools replaces cryptic NetWare print queue names such as "HP_4_ATBLD2" with intuitive descriptions such as "Accounting's Laser Printer." Users can view each printer by queue activity before they send jobs and can be notified by a pop-up window when jobs are completed.


DCL Provides Enterprise-wide Application Control (NetWare, NT Server)
The DCL (Desktop Control Language) scripting language, which relies on syntax similar to Visual Basic, offers administrators centralized control over a wide range of network operating parameters. The benefits of DCL are especially pronounced in software distribution, because DCL frees administrators from having to repeat installation tasks. By using DCL's macro recorder, for example, administrators can perform an installation task a single time. The macro recorder captures this information in a self-running script that can then be transparently rolled out enterprise-wide to groups chosen from either NetWare 3.x binderies or the NetWare 4.x NDS directory tree. The administrator can also perform routine file maintenance tasks using DCL scripts that are automatically activated at startup, as scheduled events, or from icons.

In addition to being a powerful administrator's tool, DCL also insulates users from

network complexities. As a user selects a program item from their desktop menu, for example, DCL scripts transparently attach users to file servers, map drives, change paths on-the-fly, and check a user's network membership and log-in rights.


IniTool Automates .INI File Management (NetWare, NT Server)

IniTool provides administrators complete control over .ini files. IniTool allows administrators to install a Windows application on the server and then capture the changes made to different .ini files. By comparing original .ini files to the new .ini files, IniTool creates an output file that can be used to distribute, control, and update .ini files on Windows desktops throughout the enterprise. Administrators can also make changes to specific .ini file lines or sections based on user IDs or NetWare groups.


Secure Station (NetWare)

NetTools also features a simple yet powerful workstation security and access control feature called Secure Station. Secure Station monitors workstation activity and locks the computer with a secure screen saver after a preset amount of inactivity. Users disengage Secure Station by entering their network password.

Two year subscription fee pricing for NetTools 5.2 and NetTools 5.2 for NT Server begins ranges from $30.00 per node for 50 nodes to $27.95 per node for 1000 licenses. All McAfee customers are entitled to two years of free updates--both major and minor--and free unlimited telephone support. Current licensed NetTools users can upgrade to NetTools 5.2 at no cost.

NetTools 5.2 begins shipping through electronic channels on March 15. The product will be available through retail channels on March 20, 1995. Electronically distributed versions are identical to shrink wrap versions, and contain no time-bombs or encryption.

Founded in 1989, McAfee is a leading vendor of Network Security & Management products for the PC LAN market. Its product line is comprised of award-winning client/server applications including anti-virus, access-control, asset management, metering, electronic software distribution, print management, help desk and remote control software products. The company's products are distributed electronically through its own World Wide Web server (www.mcafee.com), Internet (mcafee.com), its HomeBase on-line service (408-988-4004), CompuServe (GO MCAFEE), America Online (MCAFEE), through computer resellers, and through a unique worldwide network of 152 authorized agents in 65 countries who provide local sales and technical support. The company is headquartered in Santa Clara and maintains sales and product development offices in Tinton Falls, New Jersey.

# News: McAfee Introduces NetTools® 5.3; HelpPlus Trouble Ticket Module Helps Identify and Repair Improperly Set Desktop Configuration Files



*Augments Support for Adobe PostScript and HP Printer Drivers*

SANTA CLARA, CALIF. (July 17, 1995)--McAfee (NASDAQ: MCAF) today announced NetTools 5.3, the first Windows desktop configuration management package to integrate a trouble-ticket generator. To accomplish this, NetTools 5.3 now incorporates HelpPlus™, an ODBC-compliant trouble-ticket generator that automatically communicates with network administrator and help desk databases. The new module helps administrators quickly identify improperly set or altered desktop configuration files.

"At least 90% of Windows problems are caused by improperly set configuration files," said David Wilbanks, NetTools product manager at McAfee. ".Ini files, config.sys files, and autoexec.bat files are all subject to accidental corruption due to user error or new software installations. HelpPlus automatically sends all critical configuration information to administrators so that they can take quick remedial action when the user experiences a problem."

How HelpPlus Works
HelpPlus helps administrators acquire vital trouble-shooting information without having to leave their desk. HelpPlus constantly monitors client workstations for General Protection Faults (GPF). When a GPF occurs, HelpPlus automatically generates a trouble-ticket containing a detailed summary of system configuration information. Once the ticket is created, HelpPlus transmits the information directly into an ODBC-compliant database or to an administrator via e-mail. The trouble-ticket can then be viewed from the administrator's HelpPlus console or from any ODBC-compliant help desk software package such as McAfee's LAN Support Center™. e-mail notification is handled using VIM, MAPI, or MHS-compliant messaging formats.

In addition to HelpPlus, NetTools includes five other integrated modules designed to automate a network administrator's most tedious and time consuming Windows desktop configuration tasks. These modules include AppMan™ for menu administration, Print Manager™ for printer management, the DCL™ scripting language module for software distribution and application deployment, IniTool™ for Windows .ini file management, and Secure Station™ for desktop security and access control.

NetTools 5.3 features an improved Print Manager facility that provides support for Adobe Postscript Printer drivers, which have traditionally been the most troublesome of all printer drivers to install, configure and maintain. The new feature allows administrators to centrally assign an Adobe driver to a NetWare print queue. When an end-user selects the printer from the NetTools Print Manager, NetTools automatically installs and configures the Adobe drivers on the local workstation. This capability alleviates administrators from having to go to each workstation to manually setup and configure the driver. McAfee has also simplified support for several of the newest Hewlett Packard printer drivers as well.

Two year subscription fee pricing for NetTools 5.3 for NetWare and NetTools 5.3 for NT Server ranges from $32.00 per node for 50 nodes to $19.50 per node for 1000 licenses. All McAfee customers are entitled to two years of free updates--both major and minor--and free unlimited telephone support. Current licensed NetTools users can upgrade to NetTools 5.3 at no cost.

NetTools 5.3 begins shipping through electronic channels on August 1. The product will be available through retail channels on August 14, 1995. Electronically distributed versions are identical to shrink wrap versions, and contain no time-bombs or encryption.

Founded in 1989, McAfee is a leading vendor of Network Security and Network Management products for the PC network management market. The Company is also a leader in Internet and Web-based electronic software distribution. McAfee is headquartered in Santa Clara and can be reached by phone at (408) 988-3832 or by fax at (408) 970-9727.

# News: Ontrack Receives Department of Defense Security Award



*Competes against 11,000 candidates*

Washington D.C.--Ontrack Data Recovery announced today that it received the most prestigious honor in the industrial security field, the Department of Defense James S. Cogswell Outstanding Industrial Security Achievement Award. Ontrack Data Recovery is a member of the Defense Industry Security Program and was nominated for the award by the Defense Investigative Service. The Cogswell Award is especially important to Ontrack as it expands its offices into the D.C. area where assured confidentiality is paramount to clients in the federal government, military, law enforcement agencies, as well as large corporations.

Ontrack's Facility Security Officer, Nancy Riley says, "Ontrack is very pleased to be named one of this year's Cogswell winners. As Ontrack is required to handle sensitive data everyday, flawless security is crucial to all of our customers, especially those within the government." Riley also adds, "This award reinforces our inscrutable security program to those whose data requires the utmost confidentiality."

The award is named in honor of Colonel James S. Cogswell, USAF. Cogswell was responsible for developing basic principles in the Defense Industrial Security Program, including the Program's emphasis on excellence in industrial security. Achieving this distinction requires a total team effort by top management, the facility security officer and the facility work force.

11,000 security-cleared Department of Defense contractors compete for the award each year, and less than one half of one percent are selected to receive it. The selection process is extremely rigorous, requiring endorsements at the local and national level, including:


* A nomination by a Defense Investigative Services Industrial Security Representative ... and three consecutive inspections which show a sustained degree of excellence in program requirements,

* Endorsement of the Field Office Chief and the Region's Director of Investigations, and


* Review by the Director of Industrial Security, the Regional Director of Industrial ...Security and Defense Investigative Services.

The Cogswell Award demonstrates Ontrack Data Recovery's commitment to client confidentiality. Ontrack is focused on maintaining its excellence in security as the company looks forward to cultivating additional relationships with government divisions, departments and agencies in need of secured data protection and recovery services.

Ontrack Data Recovery specializes in recapturing data from any hard drive, tape backup, network, floppy diskette, magneto-optical device or alternative media suffering from electro-mechanical failure and/or data corruption. Ontrack has expertise in NetWare, DOS, OS/2, Windows, Windows 95, Windows NT, Macintosh, Unix, Xenix, Sun, DEC, Wang, Banyan Vines, 10Net, IBM 3600, VMS and more. Emergency services, including on-site, weekend, 24-hour and priority support are available.

Ontrack's federal offices are located at 2010 Corporate Ridge, 7th Floor, McLean, VA 22102.

1-800-650-2410 (703-749-1453). Other United States offices are located in Minneapolis, MN

1-800-872-2599 and Los Angeles, CA 1-800-752-7557.

# News: Ontrack Opens Federal Office in Washington, D.C.



*Brings data protection and recovery services closer to government customers*

Washington, D.C.--Ontrack Data Recovery, a leading provider of data protection and recovery software and services, today announced the opening of its Washington, D.C. office. The facility, which joins Ontrack's existing offices in Minneapolis, Los Angeles, London, and Tokyo, will serve the federal and local commercial market, including Ontrack's business partners. The new federal office will provide customers with a complete suite of data recovery and protection services, as well as software which is offered under a GSA pricing schedule.

Nancy Riley, Ontrack Facility Security Officer, states, "Ontrack is committed to meeting the special data protection and recovery service and software needs of its federal government customers. During our 10 years in business, we have built relationships with government agencies based on our technical expertise and special attention to security issues. With an office in the Washington, D.C. area, government computer users have first-hand access to the leading data protection and recovery services and software in the industry."

Ontrack's data recovery services are available to restore data which is at risk of loss due to corruption, crash, flooding, virus infection, burn, or any other cause. Recognizing that most companies value 100 megabytes of data at more than one million dollars*, Ontrack can safely restore the data in a very timely and cost-effective manner, ensuring its security throughout the process.

Ontrack's data protection consulting services are available to determine and recommend appropriate data protection safeguards for organizations, to assist in situations involving computer crime, or to serve as expert witnesses. Ontrack can also help in data disaster planning and recovery--with a team of mobile engineers experienced in on-site routines.

Ontrack's suite of offerings is made complete with its software products. Ontrack's Disk Manager and Disk Manager Mac hard drive installation utilities, Drive Rocket data accelerator utility, and Ontrack Data Recovery for NetWare and RecoverEase for Unix data protection and recovery products are all available from the Washington, D.C. office under GSA schedule pricing. Ontrack's GSA number is GS00K94AGS5481PS01.

With its secure facilities and safeguarding capabilities, Ontrack is able to address the handling and processing requirements of sensitive information, and currently holds numerous prime contracts with government agencies for data recovery and media declassification services. A representative list of Ontrack's government

customers includes the FBI, DEA, USDA, GSA, Department of Energy, State Department, Postal Service, FAA, and numerous military agencies. Having recently been awarded the Department of Defense James S. Cogswell Outstanding Industrial Security Achievement Award, Ontrack has received due recognition for its commitment to the security requirements of the federal government.

Ontrack Data Recovery specializes in recapturing data from any hard drive, tape backup, network, floppy diskette, magneto-optical device, or alternative media suffering from electro-mechanical failure and/or data corruption. Ontrack has expertise in NetWare, DOS, OS/2, Windows, Windows 95, Windows NT, Macintosh, Unix, Xenix, Sun, DEC, Wang, Banyan Vines, 10Net, IBM 3600, VMS, and more. Emergency services, including on-site, weekend, 24-hour, and priority options are available.

Ontrack's new federal office is located at 2010 Corporate Ridge, 7th Floor, McLean, VA 22101 800-650-2410 (703-749-1453). Other United States offices are located in Minneapolis, Minnesota (800-872-2599) and Los Angeles, California (800-752-7557). Offices are also located in London and Tokyo.

*Source: Disaster Recovery Planning and Gallop poll*

## News: FTP Software Announces Products and Technology Roadmap for Internet, Enterprise Server and Agent-based Products

*New Business Units and Partnerships Will Exploit Open Network Architectures with New Generation of Productivity Solutions for Workgroup and Enterprise Customers*

**Andover, Mass., July 14, 1995**--FTP Software Inc., today announced comprehensive product plans, partnerships and the creation of new business units targeting emerging markets with unique products for customers in the areas of Internet productivity applications, enterprise network server products and intelligent agent applications.

FTP Software announced it has formed the New Ventures Business Unit, charged with developing new and recently acquired technologies, including new Web-based server products and agent-based technology announced today, and the Networking Products Business Unit, which will extend the existing OnNet product line to provide enterprise management services for large-scale PC-based networks.

"Our new product and development vision will provide customers with the most comprehensive array of business productivity applications and server products to exploit the benefits of open networking technology," said FTP Software president and chief executive officer David H. Zirkle. "We are using Internet technologies to help customers reinvent business processes by creating new ways of utilizing and managing computing resources."

***New Business Ventures Unit Targets Emerging Markets***
The New Ventures Business Unit encompasses several operating units targeting emerging markets and is also charged with acquiring and investing in new technologies and companies. The business unit includes the following operating units:

-- **The Internet Solutions Unit**, which is expanding FTP Software's presence in the Internet market. The Internet Solutions Unit today announced it has entered into a unique technology development and marketing alliance with Open Market, Inc., with which it will jointly develop Windows NT-based versions of the Open Market WebServer product line (see related release). The Internet Solutions Unit also announced Explore Anywhere, a new class of Windows-based applications for business workgroups and telecommuters that makes inter-enterprise networking and LAN-based Internet access easy to use and administer.

-- **The Intelligent Agents Unit**, which is building agent-based enabling

technology
and applications for managing corporate networks and providing end users with new tools to find and exploit the information resources of the Internet. FTP Software' s intelligent agents are agile, responsive, and self-modifying software programs that can carry out many directed tasks, such as data gathering, remote execution and reporting, on a network. FTP Software announced today it expects to release by the end of the fourth quarter an agent development toolkit, which will provide corporate and independent software developers with an agent manager, a visual agent editor tool and an initial sampler pack of agent-based applications for managing PC-based network resources. Using FTP Software's technology, developers will be able to begin building agent-based applications ranging from searching and collecting information on the Internet to initiating remote configuration, data backup and software updates over corporate networks.

-- **The Keyword Unit** is comprised of Keyword Office Technologies, the Calgary, Alberta-based developer of protocol-independent document interchange and viewing technology software acquired by FTP Software in March of 1995. Its product line includes KEYpak, PostFAX and KEYview, which provide support of files in email, Internet, document management, workgroup computing and client-server computing environments. Certain KEYview technology has been integrated into the recently announced Explore 2.0 for Windows, the suite of Internet access applications for remote and mobile workers, small companies and home-based PC users, and OnNet™ for Windows Version 2.0, the industry leading network application suite for enterprise and workgroup users of PC-based networks.

Internet Solutions Unit Announces WebServer, Explore Anywhere
The Internet Solutions Unit today announced a comprehensive technology development and marketing pact with Open Market, Inc., developer of the most powerful World Wide Web servers on the market and the first server software to support all secure Web browsers. The Internet Solutions Unit will begin shipping Unix-based WebServer, Secure WebServer and WebReporter products this summer. FTP Software and Open Market are jointly developing Windows NT-based versions of the Open Market servers for shipment by early 1996.

The Internet Solutions Unit today also announced **Explore Anywhere for Windows**, a new member of the Explore family that ties corporate LANs and users into the Internet infrastructure and makes it easy to switch between LAN-based and remote access to the Internet. Expected to ship in August with a list price of $129, Explore Anywhere includes FTP Software's popular Explore 2.0 suite of Windows-based Internet access applications for remote and mobile workers, small companies and home-based PC users, and provides LAN drivers and a new switching capability that makes it easy for users to manage their connections whether they are remote or LAN-attached. Explore Anywhere coexists with Banyan and Novell Netware networks, as well as

supports other TCP/IP-based networks.

Networking Unit Exploiting Open Network Services for Enterprise

The Networking Products Business Unit includes the **OnNet family** of Windows-based networking applications for workgroup and enterprise network users, as well as FTP Software's award-winning TCP/IP kernel products. The Networking Products Business Unit is developing new management server products designed to provide enterprise management services for large-scale PC-based networks that include Novell, Sun, IBM and other enterprise server components.

The recently announced OnNet for Windows Version 2.0 provides an enterprise suite of Windows-based network applications, including InterDrive® 95, a high-performance Windows 95-ready NFS client. InterDrive 95 is fully integrated into the Windows 95 user interface, providing access to built-in login and security features. The OnNet application suite incorporates FTP Software's VxD TCP/IP 32-bit kernel technology, which has become the de facto corporate networking standard. The Networking Products Business Unit will also separately provide InterDrive®NT, an NFS client supporting Windows NT.

In addition to extending the OnNet desktop product family, the Networking Products Business Unit is developing management server products designed to encompass a broad range of enterprise server platforms. The new organization is developing server software technology focusing on workgroup collaboration, server management and mobile computing. The new product line is expected to begin shipping in 1996 and further details will be announced closer to availability.

"FTP Software will lead the market in providing applications and support that make it possible to share information and access resources across workgroup LANs, enterprise networks and the global Internet," said Zirkle. "We will be a leading supplier of Web application products--applying proven client expertise to exploit the new emerging Web server technology--and we will extend our heritage as the pioneering PC-based open networking company by delivering a new generation of network software for the enterprise."

FTP Software is the leading independent supplier of TCP/IP software and applications that enable millions of PC users worldwide to access resources across workgroup LANs, enterprise networks and the global Internet. The publicly held company (Nasdaq: FTPS) is a pioneering developer of interconnectivity applications and is committed to providing technically superior products for sharing of information across disparate computing platforms and networks. FTP markets its products and services worldwide through an international distributor network, original equipment manufacturers (OEMs) and direct sales.

FTP Software and InterDrive are registered trademarks and OnNet is a trademark of FTP Software, Inc. Other tradenames, trademarks and registered

trademarks are the property of their respective holders.

Note to EDITORS: Information on FTP Software Inc., including this press release, is available electronically via FTP Software, Inc.'s World Wide Web home page (http://www.ftp.com) or anonymous ftp site:ftp.ftp.com.

# News: FTP Software Ships First NFS Client for Windows 95



*Also Announces Shipment of New OnNet™ for Windows Networking Applications Suite*

**Andover, Mass., August 28, 1995**--FTP Software, Inc. today announced availability of InterDrive®95, the first NFS (Network File System) client software product for Microsoft Windows 95. InterDrive 95 provides users with transparent network resource sharing of applications, information or devices, such as printers or CD-ROM drives. InterDrive 95 is fully integrated into the new Windows 95 user interface; the Microsoft operating system includes information files that make it easy to install the NFS client.

InterDrive 95 is available either as a standalone application or as an integrated component of OnNet™ for Windows Version 2.0, a suite of Windows networking applications and industry leading 32-bit Virtual Device Driver (VxD)-based TCP/IP kernel for enterprise and workgroup users. FTP Software also announced today that it has begun first customer shipments of its OnNet for Windows Version 2.0, which operates on Windows 95 and other versions of Microsoft Windows.

"FTP Software has worked closely with Microsoft to forge tight links between InterDrive and Windows 95 so that we can guarantee users higher performance and flexibility, and is proud to have been invited to demonstrate the first NFS client at the Windows 95 launch," said Bart Broussard, FTP Software's vice president of marketing. "InterDrive provides new options for utilizing and managing computing resources as companies evaluate and adopt the Windows 95 platform."

### InterDrive 95 Brings Remote Resources to the Desktop User

InterDrive 95 is a 32-bit multi-threaded, VxD, kernel-space NFS client which works at the same level of priority as the operating system, providing users with higher network performance. InterDrive works with either the FTP Software or Microsoft Windows 95 TCP/IP kernel, and interoperates easily with other network operating systems, such as Microsoft LAN Manager, Banyan VINES or Novell NetWare. To InterDrive users the shared information or hardware resource appears to be directly connected to their desktop.

FTP Software already has received over 1,200 requests from nearly 30 countries for a preview of InterDrive 95 from a wide range of desktop users who want to share resources. Ford Motor Company is implementing a Windows 95 rollout plan that incorporates FTP Software's InterDrive 95, "Ford Motor Company is

making InterDrive 95 available on half of the PCs slated to get Windows 95 software through the end of 1996. Ford will use InterDrive 95 to share information between departments, providing access to multiple servers from a single desktop."

### *OnNet for Windows Version 2.0--Networking Applications and Platform Portability*

 OnNet for Windows Version 2.0 is an enterprise suite of Windows-based network applications and includes a series of InterDrive NFS clients for different Windows platforms. The OnNet application suite incorporates FTP Software's popular, easy-to-use Internet applications, including enhanced Mosaic 2.0, MIME and MAPI supported OnNet Mail e-mail, KEYview™, Network News reader and Gopher+ information retrieval tool. OnNet's advanced terminal emulation includes enhanced TN3270 support to connect to mainframes with 3287 printing and IND$FILE support; TN5250 support to connect to AS/400 systems; scripting for automating tasks; and WinHLLAPI support.

OnNet 2.0 includes FTP Software's VxD TCP/IP 32-bit kernel technology, which has become the de facto corporate networking standard. With OnNet 2.0's new "intelligent install" feature, users can run the WinSock compliant applications over the new version of FTP Software's VxD-based TCP/IP kernel or Microsoft's stack, selecting either a custom installation of selected applications or an express full application installation. OnNet's Kernel IP switching capabilities support either LAN and serial connections, transparently switching from ethernet (LAN) to serial line (dial-up) connections without user intervention. FTP Software provides a single product that works with any Windows system that an enterprise may use, including the high-performance new 32-bit Windows 95 and Windows NT systems, as well as Windows 3.1 and Windows for Workgroups.

### *Pricing and Availability*

InterDrive 95 is available immediately as a standalone product with a single user list price of $249. InterDrive NFS clients are also available as components of OnNet for Windows Version 2.0. OnNet for Windows Version 2.0 is immediately available with a single user list price of $450. InterDrive NT is expected to be available as a standalone product with a single user list price of $249 in the fall of 1995.

FTP Software is the leading independent supplier of TCP/IP software and applications that enable millions of PC users worldwide to access resources across workgroup LANs, enterprise networks and the global Internet. The publicly held company (Nasdaq: FTPS) is a pioneering developer of interconnectivity applications and is committed to providing technically superior products for

sharing of information across disparate computing platforms and networks. FTP markets its products and services worldwide through an international distributor network, original equipment manufacturers (OEMs) and direct sales.

FTP Software and InterDrive are registered trademarks and OnNet and KEYview are trademarks of FTP Software, Inc. Other tradenames, trademarks and registered trademarks are the property of their respective holders.

Note to EDITORS: Information on FTP Software Inc., including this press release, is available electronically via FTP Software, Inc.'s World Wide Web home page (http://www.ftp.com) or anonymous ftp site:ftp.ftp.com.

## News: FTP Software Announces New Versions of Internet Access and Network Applications Suites



*Industry-leading TCP/IP Provider Introduces Explore 2.0 and OnNet ™2.0*

**Andover, Mass., June 12, 1995**--FTP Software, Inc. announced today Explore Version 2.0 for Windows, a new version of its popular suite of Internet access applications for remote and mobile workers, small companies and home-based PC users, and OnNet™ for Windows Version 2.0, a new release of its industry leading PC-based TCP/IP networking solution for enterprise and workgroup users.

Both Explore and OnNet now feature unique KEYview™ document viewing and information access technology from FTP Software's acquisition of privately-held Keyword Office Technologies, Ltd., the Calgary, Alberta-based developer of protocol-independent document interchange and viewing technology software. The integration of a subset KEYview's powerful capabilities provides new file viewing to Internet and corporate network users. Users can quickly view and print fully formatted, popular word processor, graphics, image and spreadsheet files received from the Internet via e-mail, the Mosaic browser, Gopher+ or FTP.

"FTP Software is strengthening its product portfolio by providing customers with important features such as Internet access and Internet integration tools," said Lucinda Santisario Borovick, research manager, International Data Corporation.

### Explore Provides Complete Internet Access Suite

Explore 2.0 incorporates a Virtual Device Driver (VxD) kernel and a complete suite of easy-to-use Windows applications, including an advanced World Wide Web browser, powerful and easy-to-use e-mail, news, Gopher+, Telnet and FTP (file transfer protocol), to provide remote access to the Internet and enterprise networks. FTP Software has integrated the KEYview technology with Window's File Manager, Mosaic 2.0, the latest version of the innovative Web browser, and Mail OnNet, a powerful e-mail application supporting the MIME and MAPI standards, to provide new capabilities and ease of use to exploit the increasing resource-sharing capabilities of the Internet. Mail OnNet's tasking capability automates mail management by filtering according to user preferences. Explore 2.0 features the new Launcher task manager, providing quick and easy one-click access to the full suite of Internet applications. Explore also provides new technical features, such as WinISDN support, that enhance access to the Internet.

Explore 2.0 s applications are designed to meet users' needs to remotely access and utilize the Internet and as well as enterprise TCP/IP networks. Explore's Registration Wizard automatically establishes Internet access accounts with partnering service providers. FTP Software has joined with the Portal Information Network and MCI to provide U.S. Internet access. Explore's Network News lets users read and participate in Usenet news discussion groups and send e-mail via Explore's MAPI-enabled, Mail OnNet e-mail application. The Connection Wizard Dialer automates the initial and subsequent Internet connections, including dialing the modem and logging into the remote network.

"The new generation of remote users demands fast, seamless access to resource-sharing capabilities and the Internet," said Steve Shank, vice president of marketing and sales at Portal Communications, one of the largest U.S. providers of dial-up Internet services. "Explore delivers the complete, integrated access approach that this fast growing user segment needs."

**OnNet Features Interdrive®95, NFS client support for Windows95**

OnNet for Windows Version 2.0 provides enterprise, department and workgroup users with a complete networking solution that integrates in one product the full-featured TCP/IP 32-bit kernel technology that has become the de facto corporate networking standard together with a suite of essential Windows applications, including Interdrive95, a high-performance Windows95-ready NFS client. With OnNet 2.0's new "intelligent" install feature, users can run the WinSock compliant applications over the new version of FTP Software's VxD-based TCP/IP kernel or other industry standard compliant protocol stacks, selecting either a custom installation of selected applications or an express full application installation.

Working with both older Windows systems and new high-performance 32-bit systems, OnNet 2.0 provides users with platform portability and flexibility. Users can take advantage of OnNet's 32-bit, multithreaded kernel-space NFS client with higher priority performance. This NFS client is fully integrated into the Windows95 user interface, providing access to built-in login and security features. Interdrive NFS client support provides end user access to public printers and directories or file systems on computers running an NFS server, as if the programs or files were on a local PC. Separately, FTP Software will provide Interdrive NT, an NFS client supporting Windows NT.

OnNet 2.0 also provides the popular, easy-to-use Internet applications featured in Explore OnNet 2.0, including enhanced Mosaic 2.0, MIME and MAPI supported OnNet Mail e-mail, KEYview, Network News reader and Gopher+ information retrieval tool. OnNet's advanced terminal emulation includes enhanced TN3270 support to connect to mainframes with 3287 printing and IND$FILE support; TN5250 support to connect to AS/400 systems; scripting for automating tasks and WinHLLAPI support. OnNet's Dialer supports automatic serial and LAN

connections and cuts users' costs with predetermined disconnects after periods of inactivity.


**OnNet Kernel Provides Advanced Connectivity**

OnNet 2.0's kernel provides new advanced connectivity functions including:

Kernel IP Switching--provides switching capabilities that support either LAN and serial connections

NetWare/IP v2.1 client--enables LAN Workplace applications and NetWare/IP to run over the FTP Software kernel

IP Trace--performs a detailed analysis of network packets on the PC host, providing network troubleshooting help

Router Discovery--discovers and automatically configures additionally available routers saving network administration costs

Serial IP Scripting--provides scripting language to define a wide range (SLIP, PPP and ISDN) of connections for automated remote access to corporate systems.

On Net 2.0's kernel also provides WinISDN support which enables users to effortlessly connect to service providers offering WinISDN connections with dynamic IP address assignment; SOCKS v4 support which provides network firewall support via a standard protocol and Network Information Service (NIS) support for IP name resolution. The IP Security support within OnNet's kernel addresses the specialized IP security needs of certain networks, including government agencies.


### *PC/TCP® Network Software for DOS Also Announced*

FTP Software, Inc. also announced today PC/TCP® Networking Software for DOS version 4.0, a new version of its TSR kernel based networking solution. PC/TCP Network Software 4.0 includes a variety of DOS networking applications enabling PCs to share files, access remote applications and run distributed applications; and FTP Software's award winning kernel technology.


### *Pricing and Availability*

Explore 2.0 will be available by early August at an estimated street price of $69. OnNet for Windows Version 2.0 and PC/TCP Network Software for DOS Version

4.0 will be generally available in the third quarter of 1995, with pricing to be announced at that time.

FTP Software is the leading independent supplier of TCP/IP software and applications that enable millions of PC users worldwide to access resources across workgroup LANs, enterprise networks and the global Internet. The publicly held company (Nasdaq: FTPS) is a pioneering developer of interconnectivity applications and is committed to providing technically superior products for sharing of information across disparate computing platforms and networks. FTP markets its products and services worldwide through an international distributor network, original equipment manufacturers (OEMs) and direct sales.

FTP Software, PC/TCP and Interdrive are registered trademarks and OnNet and KEYview are trademarks of FTP Software, Inc. Other tradenames, trademarks and registered trademarks are the property of their respective holders.

Note to EDITORS: Information on FTP Software Inc., including this press release, is available electronically via FTP Software, Inc.'s World Wide Web home page (http:www.ftp.com) or anonymous ftp site:ftp.ftp.com.

## New: FTP Software and Open Market Join Forces to Deliver Premier Internet Business Resources



*Bring Together Leading Internet Desktop and Open Server Products and Support Organizations in Long-Term Development and Marketing Pact*

**Andover, Mass., July 14, 1995**--FTP Software, Inc., and Open Market Inc., today announced a comprehensive multi-year joint development and marketing agreement that will provide the most extensive suite of leading Internet server and desktop software backed by worldwide marketing and support. The two companies are joining forces to form a world-class, market-leading partnership that will provide customers with new Internet tools for reinventing internal business processes and expanding their presence to the growing online marketplace.

According to the agreement, FTP Software will immediately begin shipping Open Market's Unix-based WebServer, Secure WebServer and WebReporter. Open Market will immediately begin shipping FTP Software's Internet client products. Additionally the two companies will jointly develop new products for the Windows NT environment based on the Open Market product line.

The announcement initiates a powerful new force in the emerging Internet market that will provide the most comprehensive array of business productivity applications and server products to exploit the benefits of open networking technology. FTP Software is a leader in open networking and the premier vendor of leading Internet desktop applications with over a million users worldwide and sales in more than 75 countries. Open Market is a pioneer in business solutions for open networks and recently began shipping the Open Market WebServer and Secure WebServer products, the first offerings in a line of industrial-strength advanced server software that form the foundation for electronic business solutions.

FTP Software and Open Market have agreed to an extensive joint development effort that initially is expected to produce Windows NT versions of WebServer and Secure WebServer by early 1996. FTP Software will also co-market Open Market's advanced transactional products, which are the choice of major corporations who are developing some of the World Wide Web's most heavily visited sites, such as Time Warner Inc.'s Pathfinder and Conde Nast's Traveler Online. The WebServer products coupled with FTP's Explore product family provide a complete, easily-administered electronic business solution not only for connecting to the World Wide Web, but also for utilizing Internet-based technologies to reinvent internal business processes, such as publishing internal documents on an employee-wide network.

**Most Powerful Web Server**

"Open Market provides the most powerful Web server technology available, which will anchor the offerings of our Internet Solutions business unit," said David H. Zirkle, president and chief executive officer of FTP Software. "Together we will deliver the most complete, standards-based solution for businesses to exploit the full resources of the Internet and corporate inter-enterprise networks."

The agreement with Open Market complements plans announced today by FTP Software's new Internet Solutions Unit, which is using Internet technologies to develop products and services to help customers reinvent business processes and compete in today's online marketplace. (*See separate announcement for further details.*)

"FTP Software's worldwide presence and extensive installed base, coupled with its Windows and Windows NT development expertise, represents a tremendous opportunity to expand Open Market's reach," said Shikhar Ghosh, Open Market's CEO. "Corporate information systems and networking managers, who already rely on FTP Software's worldwide presence and proven networking software, are seeking to move their businesses onto the Internet. This partnership will deliver everything they need for deploying innovative, secure and stable systems, including the best networking client and server technologies backed up by worldwide distribution, technical support and service."

Open Market's Web Server and Secure Web Server allow hundreds of simultaneous connections to the World Wide Web and incorporate open standards such as the Common Gateway Interface (CGI), a standard interface for server scripts and HyperText Transport Protocol (HTTP) for interoperability with all existing Web clients. Secure Web Server has the security features ensuring that the electronic commerce of business-to-business transactions can take place on the WWW. Using the Webstone benchmark software, the WebServer achieved 50% higher performance under heavy use than other commercial servers. Open Market's servers support both the Secure-HTTP (S-HTTP) and Secure Sockets Layer (SSL) security approaches, ensuring protection of corporate data and transactions.

*Pricing and Availability*

FTP Software will begin worldwide shipments of the Unix versions of WebServer, Secure WebServer and WebReporter in August to OEM and business customers. Web Server will have a list price of $1,495, Secure Web Server will have a list price of $4,995 and WebReporter will have a list price of $495. Availability and pricing of Windows NT versions will be announced at a later date.

Founded in 1994, Open Market, Inc., develops and markets software, services and industry-specific solutions for business solutions on open networks. The company is the only vendor offering a complete electronic infrastructure for establishing and managing a business on the Internet, ranging from online store creation for small companies to custom business solutions for large businesses. Major corporations who've chosen Open Market's technology to establish their Internet businesses include Time Inc., Tribune Co., Advanced Publications, Inc., Lexis-Nexis, Conde Nast, Banc One and First Union Corp. Open Market can be reached on the World Wide Web at: http://www.openmarket.com.

FTP Software is the leading independent supplier of TCP/IP software and applications that enable millions of PC users worldwide to access resources across workgroup LANs, enterprise networks and the global Internet. The publicly held company (Nasdaq: FTPS) is a pioneering developer of interconnectivity applications and is committed to providing technically superior products for sharing of information across disparate computing platforms and networks. FTP markets its products and services worldwide through an international distributor network, original equipment manufacturers (OEMs) and direct sales.

FTP Software and InterDrive are registered trademarks and OnNet is a trademark of FTP Software, Inc. Other tradenames, trademarks and registered trademarks are the property of their respective holders.

Note to EDITORS: Information on FTP Software Inc., including this press release, is available electronically via FTP Software, Inc.'s World Wide Web home page (http://www.ftp.com) or anonymous ftp site (ftp.ftp.com).

## News: Shiva Announces Major Enhancements to Remote Access Software for LANRover and NetModem Platforms



*New Features Include Enhanced IP, Improved Security, FAX and Windows 95 Support*

**Burlington, Mass.**, March 13, 1995--Shiva Corporation today announced major software enhancements to the company's market-leading LanRover and NetModem remote access servers. The new features included in Release 3.5 significantly expand the flexibility for network management and security, while providing additional dial-in, dial-out and LAN-to-LAN capabilities for mobile professionals, telecommuters and small branch offices.

The remote access market continues to expand rapidly, with worldwide estimates projected to grow to $1.5 billion by 1997, as stated by Infonetics Research. As such, increasingly large numbers of individuals and organizations are being introduced to remote access. The new capabilities introduced in Release 3.5 combine significantly increased functionality and improved ease-of-use for remote access users and network managers alike.

"Remote access demand is booming," said Frank Ingari, Shiva's President and CEO. "Organizations of all sizes are rapidly moving their most critical information and basic business processes onto backbone networks. These organizations now have an urgent need to provide anytime, anywhere access for their mobile workers and telecommuters. The move to widespread production deployment is forcing a strategic examination of remote access requirements, such as interoperability, remote adapted routing, reliability, usability and security. With the 3.5 announcement, we have further addressed these issues, reinforcing Shiva's role as the remote access leader in real world production systems."

In today's related announcement of new 8235 models and features, IBM Corp. has said they will soon be providing the new functions in Release 3.5. Antoine Granatino, Vice President of Campus Networking, stated that IBM is excited about the new enhancements to the 8235 server family which includes blades for the 8250/8260 hubs. IBM is a co-development partner with Shiva for remote access products.

### Windows 95 Support, ShivaRemote API and STAC Data Compression

Remote users dialing into corporate LANs through Shiva remote access servers may do so using either ShivaRemote (Shiva's remote access client) or a third-party client, such as Windows NT 3.5 Workstations or Apple Remote Access 1.0

and 2.0. Release 3.5 represents the first remote access software to offer full Windows 95 support, and is based on the previously announced technical collaboration between Shiva and Microsoft. This support will allow companies evaluating Microsoft's new operating system to dial in directly to either a Shiva LanRover or NetModem server.

Also included is a ShivaRemote API for Windows 3.l and Windows-for-Workgroups 3.11. This API was co-developed with Microsoft and is based on a similar API available in Windows 95. This API allows developers to tightly integrate dial-in access with client/server applications, programatically initiating and breaking connections to conserve resources and reduce costs.

"RealInfo develops and markets an on-line real estate information service," said Bob Byrnes, president of RealInfo. "By using the ShivaRemote API in our Target Property product, users equipped with the software and a modem simply dial in to a Shiva LanRover and access our client/server application. The ShivaRemote API initiates and breaks the connection transparently, making the application very easy to use."

ISDN is rapidly becoming the remote access technology of choice for telecommuters and branch offices. ISDN terminal adapters, however, do not adhere to any standard data compression scheme. Shiva has worked closely with Microsoft to implement Microsoft's Windows 95 version of STAC data compression, the emerging compression standard. Release 3.5 includes STAC data compression supporting both analog and digital connections for all PPP dial-in and LAN-to-LAN connections. With STAC compression and ISDN, the user will experience substantive improvements in performance.


**New Fax Capabilities**

Release 3.5 extends Shiva's unique dial-out technology with the ability to send faxes directly from the desktop using any Shiva remote access server. This enables users to save time and improve communications by eliminating the two-step process of printing and faxing. Network managers can also reduce costs and improve security, since either LanRovers or NetModems can be used as a modem pool, eliminating the need for additional modems and analog phone lines to provide users with dial-out fax capabilities at the desktop. Release 3.5 supports the use of Delrina's WinFax PRO 4.0. Support for other Windows and Macintosh desktop fax packages is planned.


**Simplifying User Connectivity**

Release 3.5 simplifies user connectivity in a LAN-to-LAN environment. Network managers can set up multiple remote sites with a simple point-and-click access

using graphical Windows and Macintosh interfaces in Shiva NetManager (Shiva's network management software). Once a site has been configured, the new LANConnect application allows authorized Windows or Macintosh users on the LAN to quickly create and break connections to remote sites by simply double-clicking an icon.

Mobile users on the road typically don't carry documentation with them, so ShivaRemote 3.5 includes complete on-line documentation. This is a complete dial-in reference that includes hypertext links and full indexing.

**Enhanced Network Management, Improved Security and Terminal Server Support**

Security is critical to organizations deploying remote access. Release 3.5 provides the highest level of security available through enhanced IP support and increased integration with security devices. Specifically, Release 3.5 adds:

- TACACS Support--TACACS is an authentication protocol used between two devices, such as a LanRover and an IP user database. Shiva's support of TACACS, both un-extended and extended versions, allows network managers more flexibility when designing authentication schemes.

- Centralized User Lists--A single LanRover or NetModem on the network can act as a user-list server for all other Shiva devices, providing a centralized, and more manageable, user list.

- Password Aging and Change Password Option--Users can now change their own passwords at the prompting of the LanRover or NetModem, alleviating network managers from the burden of creating and maintaining user passwords.

Shiva continues to improve its network management capabilities. Specifically, Release 3.5 adds:

- DHCP Support--Because IP addresses for dial-in users can be assigned through a DHCP server, addressing is centralized, administration is eased and IP addresses are conserved. This adds a fourth method of managing IP addresses.

- Terminal Server Support--Extended dial-in functionality for VT-style terminals allows remote terminal servers to connect to the same modem and phone lines used for remote access. This provides single phone number access for PC, Macintosh computer, UNIX and dumb-terminal dial-in connections.

- IP Network Management--IP-only networks can now use the PC version of

Shiva NetManager running over TCP/IP protocols.

- Delta-RIP--An area of core competency for Shiva has always been the adaptation of LAN-based technology for remote access, which Shiva terms remote adapted routing. Shiva's Delta technology, comprised of protocols designed to reduce overhead and conserve bandwidth in remote access, is an example of remote adapted routing. New with Release 3.5 is Delta-RIP, a capability that reduces router overhead to a minimum across LAN-to-LAN links, by sending only changes to routing tables over the link.

**Pricing and Availability**

Release 3.5 will be shipping March 20, 1995. The software upgrade price ranges from $299 to $599, depending on the customer's current version level.

Founded in 1985, Shiva Corporation (Nasdaq:SHVA) develops and manufactures multiprotocol, multiplatform remote access products featuring transparent remote node connectivity to Local Area Networks. The LanRover and NetModem product lines provide access to Novell NetWare, TCP/IP, Microsoft LAN Manager, Windows for Workgroups, Windows NT, SNA and AppleTalk network resources. The Shiva family of standalone and integrated remote access servers enable telecommuters and mobile professionals to make dial-in connections to the LAN, LAN-based users to make dial-out connections from the desktop to the Internet and other on-line services, and branch offices to make dial-up LAN-to-LAN connections to central sites over both PC and Macintosh computers. Shiva can be accessed electronically at either sales @ shiva.com; over the Shiva BBS at 617/273-0023 (300-28,000bps - 8,N,1); or through Shiva's World Wide Web home page at www.shiva.com.

SHIVA and SHIVA WITH DESIGN (the Company's logo) are trademarks of Shiva Corporation and NETMODEM/E, NETMODEM and LANROVER are registered trademarks of Shiva Corporation. All other trademarks belong to their respective companies.

# News: Shiva Corporation Finalizes the Acquisition of Spider Systems

BURLINGTON, Mass., August 22, 1995--Shiva Corporation (NASDAQ: SHVA), a market leader in remote access technology, today announced the completion of its acquisition of Spider Systems Limited, the ISDN networking company based in Edinburgh, U.K. The definitive agreement to acquire Spider was previously announced by Shiva on June 14, 1995. Spider Systems Limited will assume the name Shiva Limited and will operate as a wholly-owned subsidiary of Shiva. The acquisition brings Shiva ISDN and WAN technologies that will enable the Company to provide customers around the world with remote access to public and private networks.

At closing, Shiva issued 1,961,803 shares in exchange for all of the outstanding share capital of Spider Systems. The acquisition will be accounted for as a pooling of interests. Shiva will take a charge to earnings currently estimated to be in a range of $13-14 million in the current quarter to cover transaction costs and merger-related expenses. The charge will result in a combined company loss for the third fiscal quarter ending September 30, 1995.

Shiva develops and manufactures multiprotocol, multiplatform, client/server remote access products featuring transparent remote node connectivity to LANs. Shiva's family of standalone and integrated remote access servers enables telecommuters and mobile professionals to make dial-in connections to the LAN, LAN-based users to make dial-out connections from the desktop to the Internet and other on-line services, and branch offices to make dial-up LAN-to-LAN connections to central sites over both PCs and Macintosh computers.

SHIVA, SHIVA WITH DESIGN (the Company's logo), NETMODEM/E and NETMODEM are registered trademarks of Shiva Corporation, and LANROVER is a trademark of Shiva Corporation. All other trademarks belong to their respective companies.

Shiva can be accessed electronically at either sales@shiva.com; over the Shiva BBS at 617/273-0023 (300-28,000bps - 8,N,1); or through Shiva's World Wide Web home page at www.shiva.com.

## News: Shiva Announces Extensive Remote Access Capabilities for Branch Offices, Small and Departmental LANs

*Newly Architected NetModem/E 28.8 Features V.34 Modem, Fax, Windows 95, and Multiprotocol, Multiplatform Support*

**Burlington, Mass.** March 13, 1995--Shiva Corporation today announced a new hardware platform for its single-port NetModem/E remote access server, integrating extensive features previously available only in Shiva's LanRover products. This new platform will provide organizations with small and departmental LANs a robust, multiprotocol, multiplatform solution for remote access. New features include an integrated V.34 modem and Shiva's Release 3.5 software, providing enhanced protocol support, improved security, dial-out fax, new LAN-to-LAN capabilities and Windows 95 support. (see Shiva's Release 3.5, also announced today.)

As the number of small offices and home offices continues to increase and workers become more mobile, the need for sophisticated remote access solutions is expanding. Market research estimates that there are more than 300,000 small offices in the U.S. today, with less than 25 employees. Of those 300,000 locations, 67 percent are outfitted with some type of remote technology and it is estimated that they will all be connected by 1998 (Infonetics Research).

"Where and when organizations and individuals perform their work is changing significantly, with telecommuters and mobile professionals placing a demand on companies to provide flexible options for their workforces," said Frank Ingari, Shiva's President and CEO. "The NetModem has always been a proven solution to remote access for individuals or organizations with limited numbers of employees dialing in to the LAN. With NetModem/E 28.8, we are able to provide those organizations with the same fully integrated, low-cost solution, now loaded with features previously available only in our LanRover family."

Featuring an integrated V.34 modem, NetModem/E 28.8 doubles the speed of existing connections for dial-in and dial-out when compared to previous NetModem platforms--28.8 Kbps, and up to 115.2 Kbps with compression. Because all PC and Macintosh computers on the LAN can take advantage of the dial-out capabilities within the NetModem/E 28.8, workgroups and organizations with small LANs will not need to make a significant investment to upgrade all existing modems to the new V.34 standard.

**New Dial-In and Dial-Out Functionality**

NetModem/E 28.8 provides many new dial-in and dial-out capabilities, including support for dial-out fax, Windows 95, and terminal servers. As in previous versions, NetModem/E 28.8 also supports simultaneous remote control and remote node. Additionally, with remote users dialing in and LAN-based users dialing out through a single phone line, the amount of phone lines and related telecommunications overhead needed for the small office is greatly reduced.

- *Dial-out fax*--LAN-based users will have the ability to fax directly from their desktops. This will save time and increase productivity because it eliminates the two-step process of printing a document, then faxing it. Dial-out fax capabilities also represent significant cost savings to a small organization, eliminating the need for additional modem hardware to be connected to every PC.

- *Windows 95*--Because Shiva is the first remote access vendor to offer full support for Windows 95, companies evaluating this operating system will be able to click an icon and dial directly into Shiva's NetModem/E 28.8.

- *Multiprotocol support* --NetModem/E 28.8 provides robust multiprotocol support and simplified LAN-to-LAN capabilities. Simultaneous multiprotocol options include ARA 1.0 and 2.0, IPX, NetBEUI, LLC/802.2, and TCP/IP, including SLIP, PPP, and MacTCP. All multiprotocol support is delivered through one phone line.

- *Simultaneous remote control and remote node*--Legacy applications, such as flat-file database applications, perform better over a remote control connection. As such, Shiva has worked closely with Symantec to deliver the Norton pcAnywhere Shiva edition of Symantec's pcAnywhere remote control software. Bundled with the NetModem, the Shiva edition of pcAnywhere allows remote users, in the same dial-in session, to switch between a network application and a DOS or Windows remote control session. The combination of remote node and remote control technology allows users to run any type of application in the method that optimizes speed and performance.

- *Simplified LAN-to-LAN access*--Windows and Macintosh authorized users can establish and break a LAN-to-LAN connection by pointing and clicking an icon. These LAN-to-LAN links also can be configured to be permanent, established and broken at specific times, or broken when a specified period of inactivity occurs.

- *Terminal Server Support*--Extended dial-in functionality for VT-style terminals is included. This provides single phone number access for PC, Macintosh computer, UNIX and dumb-terminal dial-in connections over the same modem and phone lines used for remote access.

**Simplified Internet Access**

As more individuals and organizations demand access to the Internet, Shiva understands the importance of simplifying that access. NetModem/E 28.8 provides the ability for users to dial-out to the Internet from PC and Macintosh computers through any of the three major on-line services providers, or through third-party Internet access companies. Connecting to the Internet through a NetModem/E 28.8 means users can avoid the cost of equipment such as a locally attached modem or analog phone line, router connection, Internet Firewall device, and a TCP/IP protocol stack.

**Expanded Security and Network Management Features**

NetModem 28.8 benefits from robust security, network management, and application integration functionality previously available only with multiport remote access servers.

- *Enhanced security*--Security is critical to any size organization implementing remote access. NetModem/E 28.8 includes: centralized user lists, a password aging and change password option, activity logging, roaming dial-back, NetWare Bindery authentication, DHCP and TACACS support.

- *Network management*--Configuration and maintenance of the NetModem remote access solution is supported locally or remotely over IP, IPX, and AppleTalk, or via a command line.

- *Remote API*--Application developers can write custom application interfaces which initiate and break a dial-in connection seamlessly to the user. The remote API can also be used to integrate with third-party security devices.

**Pricing and Availability**

Pricing for the NetModem/E 28.8 with Release 3.5 is $1,999, with a special offer of $999 to customers trading in their existing NetModem/E. This offer is good through May 15, 1995. Included with the NetModem/E 28.8 are an integrated V.34 modem, Shiva NetManager (Shiva's network management application), unlimited licenses for ShivaRemote (Shiva's client software), and 10 remote user licenses for the Norton pcAnywhere Shiva edition of pcAnywhere. NetModem/E 28.8 will ship on March 20, 1995, and will be available from Shiva resellers and distributors.

Founded in 1985, Shiva Corporation (Nasdaq:SHVA) develops and manufactures multiprotocol, multiplatform remote access products featuring transparent remote node connectivity to Local Area Networks. The LanRover and NetModem product

lines provide access to Novell NetWare, TCP/IP, Microsoft LAN Manager, Windows for Workgroups, Windows NT, SNA and AppleTalk network resources. The Shiva family of standalone and integrated remote access servers enable telecommuters and mobile professionals to make dial-in connections to the LAN, LAN-based users to make dial-out connections from the desktop to the Internet and other on-line services, and branch offices to make dial-up LAN-to-LAN connections to central sites over both PC and Macintosh computers. Shiva can be accessed electronically at either sales @ shiva.com; over the Shiva BBS at 617/273-0023 (300-28,000bps - 8,N,1); or through Shiva's World Wide Web home page at www.shiva.com.

SHIVA and SHIVA WITH DESIGN (the Company's logo) are trademarks of Shiva Corporation and NETMODEM/E, NETMODEM and LANROVER are registered trademarks of Shiva Corporation. All other trademarks belong to their respective companies.

## News: N. Telecom (NORTEL) and Shiva Forge Alliance on Internet and Remote Dial-up Switching for ISPS and Large Enterprises

*Joint Agreement Includes Technology Transfer, Development and Marketing Support*

**Burlington, MA and Richardson, TX**--May 15, 1995--Northern Telecom (Nortel), a leading global developer of communications products, systems and networks, and Shiva Corporation, the leader in dial-in remote access, today announced an agreement to jointly develop and market solutions to carriers, Internet Service Providers (ISPs) and major enterprises. The global agreement is focused on a new product category--the Internet and remote dial-up switch--which is a larger scale version of the remote access server and is designed for the rapidly growing market segment of Internet service providers and carriers. The agreement includes software, support, technology transfer, joint development and joint sales and marketing.

Remote access solutions give lap-top computer users and telecommuters dial-in access to corporate networks from any location. Internet access using the Nortel-Shiva technology will enable carriers and Internet Service Providers to more cost-effectively reach home-based or nomadic Internet users. According to Dataquest, some 12 million new Internet accounts will be deployed in 1996.

"The Public Switched Telephone Network and the Internet are colliding. The intersection point of these two large and sophisticated networking environments represents a market discontinuity that Nortel and Shiva intend to fill," said Klaus Buechner, Nortel's group vice president and general manager of Multimedia Networks. "By combining Shiva's experience and leadership in remote access with Nortel's strong presence in wide-area data networks, enterprise networks, and central office switching, we will create a powerful solution capable of handling the Internet and remote dial-up switching requirements of our largest public and private network customers."

"This strategic alliance with Nortel allows Shiva to expand our addressable market beyond the traditional customer premises equipment segment of remote access into the large and fast growing carrier and ISP segment," said Frank Ingari, Shiva's President and CEO. "We are delighted to work with Nortel to deliver solutions to address the unique needs of advanced service providers."

Specific product announcements are expected in the fourth quarter of 1995.

Nortel is one of the world's most broadly diversified developers of communications products, systems and networks in three key market segments--

Enterprise Networks, Wireless Networks, and Carrier Networks (switching, broadband and network applications solutions). Nortel provides equipment, services and network solutions for information, entertainment, and communications networks operated by telephone companies, personal and mobile telecommunications companies, cable TV companies, corporations, governments, universities, and other institutions worldwide.

Nortel's portfolio of data and broadband multimedia switches includes carrier ATM cell switches, such as the Magellan Concorde and edge switch, the Magellan Passport frame/cell switch for carrier and enterprise networks, the Magellan DPN-100 frame switch, and the Magellan Access switch for remote and branch offices. Nortel had 1994 revenues of $US 8.9 billion and has approximately 57,000 employees worldwide.

Founded in 1985, Shiva Corporation (Nasdaq:SHVA) develops and manufactures multiprotocol, multiplatform remote access products featuring transparent remote node connectivity to Local Area Networks. The LanRover and NetModem product lines provide access to Novell NetWare, TCP/IP, Microsoft LAN Manager, Windows for Workgroups, Windows NT, SNA and AppleTalk network resources.

The Shiva family of standalone and integrated remote access servers enables telecommuters and mobile professionals to make dial-in connections to the LAN; LAN-based users to make dial-out connections from the desktop to the Internet and other on-line services; and branch offices to make dial-up LAN-to-LAN connections to central sites over both PC and Macintosh computers.

Shiva can be accessed at sales @ shiva.com; over the Shiva BBS at 617/273-0023 (300-28,000bps - 8,N,1).

## News: Shiva to Acquire Spider Systems, Limited., U.K.-based Provider of ISDN and WAN Technologies



*The Combined Entity Will Provide Customers Worldwide with Remote Access to Public and Private Networks*

BURLINGTON, Mass., and Edinburgh, U.K., June 14, 1995--Shiva Corporation (Nasdaq: SHVA), the market leader in remote access, today announced the execution of a definitive agreement to acquire Spider Systems Limited, the ISDN network access company based in Edinburgh, U.K. Shiva will acquire Spider Systems for approximately 2.0 million shares of Shiva common stock, currently valued at approximately $80 million. The transaction will be accounted for as a pooling of interests and is expected to close in the third fiscal quarter ended September 30, 1995.

Frank Ingari, Shiva's president and CEO commented, "Spider is a technology powerhouse in digital internetworking. It is a recognized industry leader in ISDN tariff management, and has strong technologies in dial-up routing, X.25, and Frame Relay. Since Shiva has a leadership position in single user remote LAN access, this acquisition represents a strong strategic and complementary fit that is designed to further strengthen our global leadership in remote access to public and private networks."

"Worldwide presence is very important for Spider," said Martin Ritchie, Spider's managing director. "Shiva's installed base and distribution channels will open up North American markets for Spider solutions. And our well-developed European channel will broaden deployment of Shiva products."

### Strategic and Complementary Fit

The remote LAN access market is merging with the public access communications server market. Telecommunications carriers and on-line service providers are seeking to offer unified dial-in, dial-out and LAN-to-LAN access to corporate customers and consumers.

Shiva recently announced a joint agreement with Nortel to develop and market solutions to carriers, Internet Service Providers and major enterprises. Klaus Buechner, Nortel's group vice president and general manager of Multimedia Networks commented on this acquisition, "Nortel and Shiva's relationship is intended to address the remote dial-up switching requirements of Nortel's largest public and private network customers. Shiva's acquisition of Spider Systems will enhance our ability to deliver remote access solutions to these large and

sophisticated networking environments."

ISDN is a critical technology in these newly expanded access requirements (especially for the branch office market) and the efficient management of ISDN links to costly wide area networks, called tariff management, is vital. Tariff management dramatically reduces transmission costs. Spider Systems is a recognized leader in this field.

Spider's key differentiators in tariff management include: bandwidth on demand; data compression; bandwidth aggregation and augmentation (the ability to combine different services and switch from one to the other); spoofing ("fooling" the links between LANs and WANs, so that the line is not live when not in use); security, and triggered updates.

Spider Systems has four lines of business, each one of which is complementary with Shiva's remote access strategy.

Spider's fastest-growing product line is SpiderIntegrator, an award-winning family of ISDN products differentiated by the ability to reduce, control, and measure telecommunications tariffs and by the ability to simultaneously support multiple services, such as ISDN, X.25, Frame Relay, and leased line. SpiderIntegrator received *Data Communications Magazine's* European Network Laboratories Top Performer award, as well as numerous other awards. SpiderIntegrator is expected to expand Shiva's presence in the ISDN market and provide strong dial-up router technology for the central site, the branch office and the telecommuting site.

Spider's family of integrated communications servers address network expansion requirements of both the traditional terminal server and newly expanded Internet and on-line service provider market segments. Spider's communications servers have been well received in Europe, and Shiva will be bringing this technology to the North American marketplace.

Spider Software licenses communications software to more than 100 of the world's leading OEM computer and communications manufacturers, such as Hewlett-Packard, Sun and Unisys. Spider's X.25, TCP/IP, and Frame Relay products will contribute key technology to the Shiva and Nortel joint development agreement. And Spider Software's large installed base provides Shiva with a new set of target accounts for ShivaPPP and other OEM products.

Spider Networks is a U.K.-based, 70-person, experienced network-integration service and consulting group that helps organizations accelerate the deployment of remote access enterprise-wide. Spider Networks will provide high-end network design and deployment services to corporate customers and VARs.

Shiva develops and manufactures multiprotocol, multiplatform client/server

remote access products featuring transparent remote node connectivity to LANs. Shiva's family of standalone and integrated remote access servers enable telecommuters and mobile professionals to make dial-in connections to the LAN, LAN-based users to make dial-out connections from the desktop to the Internet and other on-line services, and branch offices to make dial-up LAN-to-LAN connections to central sites over both PC and Macintosh computers.

Shiva's acquisition of Spider Systems will provide Shiva with key technology and products that will enable corporate customers to obtain full remote access solutions directly from one supplier.

## Organizational and Financial

The definitive agreement contemplates an offer by Shiva to acquire 100 percent of the outstanding share capital of Spider Systems Limited. The offer has been unanimously approved by the Board of Directors of Shiva and acceptance of the offer has been unanimously recommended by the Board of Directors of Spider. Spider shareholders, representing in excess of 90 percent of each class of outstanding Spider shares, have already tendered irrevocable undertakings to accept the offer. Shiva will take a charge to earnings in its third fiscal quarter for related expenses and restructuring costs. This charge will result in a combined company loss for the third fiscal quarter. The transaction is subject to customary conditions including SEC approval of a resale registration statement covering the shares to be issued by Shiva and Spider shareholder approval of certain charter amendments. Privately held Spider Systems will become a subsidiary of Shiva Corporation at the closing of the transaction.

The new sales organization of the combined companies will report to Frank Ingari and include Woody Benson as vice president of worldwide marketing and Asia and the Americas sales, Rob Downey as vice president of Europe, Middle East and Africa (EMEA) sales, and Peter Howells as vice president of the Network Integration Group, Spider Networks.

Dennis Chateauneuf, Shivas vice president, operations and customer service, will be general manager of Shiva Edinburgh where Shiva will continue to maintain Spiders R&D and manufacturing facilities.

SHIVA and SHIVA WITH DESIGN (the Company's logo) are trademarks of Shiva Corporation and NETMODEM/E, NETMODEM and LANROVER are registered trademarks of Shiva Corporation. All other trademarks belong to their respective companies. Shiva can be accessed electronically at either sales @ shiva.com; over the BBSNet at 617/273-0023 (300-28,000 bps - 8,N.1); or through Shiva's World Wide Web home page at www.shiva.com.

## AppWare

## AppWare Q & A

## Definition of ALMs

**What are ALMs?**

ALM stands for AppWare Loadable Module. AppWare is provided by Novell as a system for developing **cross-platform** network applications and originally consisted of four components:

1. The AppWare Foundation

2. The AppWare Loadable Modules (ALMs)

3. The AppWare Visual AppBuilder programming tool

4. The AppWare Bus

Novell recently sold the AppWare Foundation, but continues to sell Visual AppBuilder, a high-level, object-oriented programming tool, for $495, along with ALMs for $295. The ALMs are components (in the form of **icons**) that can be linked together by AppBuilder to form a complete application.

The ALM components (also called objects) reside on the client and access services like e-mail or databases on the server through NLMs. There are about 80 prebuilt ALMs at this time.

Although Novell originally intended to support many different platforms like Solaris and HP, it is currently only supporting desktop platforms such as Windows (NT in the future) and Macintosh. The ALMs support Windows APIs such as OLE.

## AppWare Q & A: Opening More Than One Database File Without the Dialog Box

**I am working on an application in which I need to open one or more database files. Is there a way to do this without using the dialog box to do so?**

Using the Load Database object should let you do this. You will need to give the explicit path of the file. If you don't give the correct path or any path, the dialog box will still appear.

# AppWare Q & A: Displaying a Graphic on Starting a Program

**Is there a way I can display an opening graphic of some type, such as a bitmap, when starting a program?**

If you have AppWare v1.2, you can download SPLASH.EXE from NetWire. This file will allow your AppWare applications to display an opening bitmap when starting a program. The bitmap will be centered on the screen and will remain until the application file is read or until a specified minimum time has passed.

## AppWare Q & A: Compiling an AppWare for Windows Program using AppWare for Macintosh



**I have written a program using AppWare for Windows but seem to have a problem compiling it in AppWare for the Macintosh. The project uses the database object, which seems to be causing the problem. Is there something that I need to do differently?**



As you have found the databases for AppWare for Windows and AppWare for the Macintosh are different. The indexes on the Windows-based AppWare are stored in decimal form, whereas the Macintosh databases are hexadecimal format. Another difference between the two databases is that the Windows database also contains object data (i.e. button and pictures information), whereas the Macintosh database doesn't.

# AppWare Q & A: Passing Command Line Parameters

**How can I pass parameters to text or number objects in the program specified on the command line when running a compiled program?**

One option is to use .INI files to pass the parameters you need to. If you have AppWare v1.2, you can use the GetCommandLine function, which is located in the Application group, to pass data.

## AppWare Q & A: QuickTime Movie Out of Synch

**I have just upgraded to AppWare v1.2 for Windows. The QuickTime Movie support seems a little more stable than v1.1. Periodically, I encounter a condition in which the sound in a QuickTime Movie seems to restart during the playing of the movie and stays out of sync for the remainder of the clip. Is there a way to prevent this from happening?**

Trying putting a Start Idle function in your project and give it a time span of ten clock ticks. From the idle function, place a Stop Idle function in the chain. This will give the movie object a chance to completely load the movie before playing it. It is also a good practice to use the Preroll function on all movies in AppWare. This will go a long way toward preventing synchronization problems.

# AppWare Q & A: GPF 90 Percent of Way Through Compile

**I have created a large project in AppWare and am having problems compiling it. AppWare generates a General Protection Fault (GPF) in Windows approximately 90 percent of the way through the compile. What do I need to look for?**

At the 90 percent point in the compile process, writing compiled code to disk begins to occur. Make sure there is sufficient disk space available for the application. If you are compiling to a network drive, make sure the login ID has Write (W) rights to the directory in which AppWare is attempting to place the compiled code.

## AppWare Q & A: Listserver

**Is there an Internet listserver I can subscribe to for AppWare discussions?**

An independent group called the AppWare Developers Association has a listserver. To subscribe to the listserver, send a message addressed to AppWare-info-request@adeva.org with a subject line of SUBSCRIBE. When sending a message to the subscribers of the AppWare list, address the message to AppWare-info@adeva.org.

## AppWare Q & A: Wrong Information Printing and Type 1 or System Error

**I have installed AppWare v1.2. There seems to be a problem. The Page Layout object prints information other than what has been selected. The Forms object also gives a Type 1 or System error when trying to print. What can I do?**

This problem has been identified by AppWare support. The fix to the problem involves changes to the Picture, Window, and Page Layout AppWare Loadable Modules(ALMs). Download the latest update from NetWire. It should fix the problem.

## AppWare Q & A: Type 1 or 11 Error Using Movie and Controller Objects

**I have a project that uses both the Movie and Controller objects. When I open or close the project several times without running the movie, I get a Type 1 or 11 error. What does this mean?**

Type 1 and 11 errors indicate memory-related problems. Try increasing the memory allocated to the application in 1-megabyte increments, recompile the application, and see if the problem disappears. If you still have a problem, install a fresh copy of Windows to a different directory on your PC, install a fresh copy of AppWare, and repeat the process--this will keep your Windows environment from being the cause of the problem.

## AppWare Q & A: Connecting Functions to Objects without Dragging Signal Lines

**I have a project that involves connecting several functions to various objects. Until now I have been dragging signal lines between the various functions and objects, which is becoming tedious. Is there a better way to connect the items together?**

Place your mouse cursor on the right arrow on the field in which you need to connect to an object, and click and hold the right mouse button. You will now see a list of objects to choose from. Highlight the one you want to use and release the mouse button.

# AppWare Procedure List

[Copying a Compiled Application](#)

[Printing the Source Code for an Appware Project](#)

# AppWare Procedure: Copying a Compiled Application

1. Verify the application you want to distribute compiles with no errors.

2. Click on Project.

3. Click on Create Application.

4. If prompted, click on Yes to save before compiling.

5. Confirm the name of the file to use to save the executable as.

6. Click on OK to indicate that the application was successfully created.

7. Look in the \APPWARE\BIN directory for a file with the name of the executable that was created but with a .REQ extension.

8. Copy all the files listed in the .REQ file to the same directory or in the same .ZIP file as the executable.

9. If your .REQ file lists BWCC.DLL, this file can be found in the Windows directory.

## AppWare Procedure: Printing the Source Code for an AppWare Project

1. Open the project in AppWare.

2. Click on File.

3. Click on Print.

## AppWare Requirements

**Client requirements:**

- MS Windows 3.1

- 386/25 or better CPU

- 8MB of RAM

- VGA monitor

- 68-138MB of disk space required, depending on selected configuration

# AppWare Network Utilities

[RAMCAL3.ZIP](#)

[REGMEM.EXE](#)

## AppWare Network Utilities: REGMEM.EXE

This utility tells you how to use the REGISTER MEMORY command. To install it, copy it to your hard disk and unzip it. Then, from the File Run menu of Windows, enter the executable REGMEM. REGMEM takes 1.1 megabytes of disk space.

## AppWare Network Utilities: RAMCAL3.ZIP



This utility tells you how to calculate RAM for a NetWare v3.x file server. To install it, copy it to your hard disk and unzip it. Then, from the File Run menu of Windows, enter the executable RAMCAL3. RAMCAL3 takes 1.1 megabytes of disk space.

## NetWare Connect

# CD HELPdesk Series: Novell Products

## Click on any icon for more information

## NetWare Connect Q & A

[Access to TCP/IP with RNS](#)

[Configuring DIALCON to Use Unlisted Modem](#)

[Dedicated Server vs. File Server Use](#)

[DIALCON Won't Initialize Modem](#)

[Dropped Connections Using TCP/IP over RNS](#)

[Monitoring Server Comm Ports](#)

[NetWare 4.10 NWCSTART.NCF Errors](#)

[Server Not Found Message](#)

[Sharing Modems among Windows Communication Program Users](#)

[Slow LOGIN and Application Access](#)

[Use on NetWare v2.2](#)

[Users Repetitively Receive Modem Pool Message from WinCIM](#)

[WIN2NCS Displays Previous User Name](#)

[Windows for Workgroups Use](#)

[Windows NT Workstation Use of WIN2NCS](#)

## Monitoring Server Comm Ports

**Is there a way to monitor the comm ports on my server for diagnostics of NetWare Connect?**

Yes. It is the AIOMON.NLM, which is included in the Netware Connect package. Type LOAD AIOMON the file server console and it will give you some good diagnostic information.

# NetWare Connect Q & A: NetWare 4.10 NWCSTART.NCF Errors

**I am trying to load NetWare Connect v1.0 on a NetWare 4.10 server with no luck. I have loaded all the patches, but NetWare Connect still gives several different errors when NWCSTART.NCF executes. Is there anything that I am missing?**

The trick to getting NetWare Connect to work on NetWare 4.10 is to install NetWare Connect and its patches before loading it for the first time. If you try to load NetWare Connect before installing the patches, the databases it uses will already have been damaged. If this is the case, uninstall the product using INSTALL.NLM, and then reinstall it and the patches. If you upgrade your copy of NetWare Connect to v2.0, no patches are required to load it on NetWare 4.1.

## NetWare Connect Q & A: Server Not Found Message

**When I call into a NetWare Connect server using Remote Node Service (RNS), I get a "Server can't be found" message when I run NETX. The server I am trying to ATTACH to is being used by other network users. Why can't I see the server? It shows when I do an SLIST.**

The problem you describe is more a timing issue than anything else. NETX is not receiving a reply in the time frame it is expecting and is reporting a "server can't be found" message. The problem should be fixed if you place a PREFERRED SERVER statement in the NET.CFG file on the workstation calling into the network. It would also be a good idea to make sure that the remote workstation is using the same package type as the NetWare Connect server and the target server that users are logging into.

# NetWare Connect Q & A: WIN2NCS Displays Previous User Name

**We are running a shared copy of Windows on the server and have installed WIN2NCS for the users to be able access NetWare Connect from within Windows. When a user pulls WIN2NCS up, it contains the name of the previous user that used the program. Shouldn't this field be blank? Why does this occur?**

It is normal for the username field to contain the former user's name. Novell doesn't recommend that WIN2NCS be installed on a shared copy of Windows; it should be installed at each user's workstation. This is so shared code violations don't occur when more than one workstation tries to use WIN2NCS at the same time. You should correct this by copying WIN2NCS to each user's workstation. Novell doesn't support shared WIN2NCS configurations.

## NetWare Connect Q & A: Sharing Modems among Windows Communication Program Users

**Is there a way for users with Windows communication programs to use a modem on a NetWare Connect server?**

Novell has released a file called WIN2NCS that allows most Windows communication programs to use a modem attached to a NetWare Connect server. The key is to look for a program that makes standard Windows modem calls and doesn't try to communicate with the modem directly.

# NetWare Connect Q & A: Users Repetitively Receive Modem Pool Message from WinCIM



**When users try to dial CompuServe from within WinCIM with the WIN2NCS extensions to NetWare Connect, they receive a dialog box that asks them to choose the modem pool they want to use. This happens several times until the modem starts to dial. What is happening and how do I fix it?**



You are seeing the program making and releasing contact with the modem. You can avoid this by mapping a static connection (one that doesn't change) in the WIN2NCS control panel. This will automatically attach the workstation to the correct modem or modem pool when a user starts WinCIM.

# NetWare Connect Q & A: DIALCON Won't Initialize Modem

**I am receiving an error message from DIALCON that it can't initialize the modem. I have confirmed that the modem is connected to the correct serial port and that the cable is good. What else can I check?**

Check the modem type you have selected in DIALCON. If it doesn't contain an exact match, try using the ZOOM modem definition or pick one of the Hayes default definitions as a starting point.

## NetWare Connect Q & A: Configuring DIALCON to Use Unlisted Modem

**I am setting up Remote Node Service (RNS) so a remote workstation can use our NetWare Connect server. The user has a modem that isn't listed in the available selections. How do I configure DIALCON to use this modem?**

You have a couple of options to choose from. You can use the ZOOM modem definition, which seems to work with most modems. If you happen to have the manual for the modem handy, you can download a modem script writer for NetWare Connect from NetWire (there are both Windows and DOS versions available) and make a new entry into the modem definition file, specifically tailored to the modem the remote user has.

# NetWare Connect Q & A: Dropped Connections Using TCP/IP over RNS



**My users are trying to run TCP/IP over a Remote Node Service (RNS) connection to our NetWare Connect server. Intermittently, they experience dropped connections. I have checked the configuration and cabling and can't find anything wrong. Do you have any suggestions?**



Make sure you have the latest Open Data-Link Interface (ODI) drivers at the workstation, including the latest TCP/IP protocol stack from Novell. Try using a slow modem speed or turn off compression. Check the phone lines at both ends to see if you hear static on the line. Make sure that the users have call waiting turned off or temporarily disabled when they place a call. Some telephone companies pulse the line so strongly to let you know of an incoming call that it confuses modems into thinking they have lost the connection.

## NetWare Connect Q & A: Use on NetWare v2.2

**We have a NetWare v2.2 server in the office. Can we load NetWare Connect on it?**

No. NetWare Connect consists of a series of NetWare Loadable Modules (NLMs). NetWare v2.2 does not support NLMs. You do have the option, however, of setting up a NetWare Runtime server (a one-user license included with NetWare Connect) on a workstation connected to your modem pool, which users can access.

## NetWare Connect Q & A: Windows NT Workstation Use of WIN2NCS



**I have installed WIN2NCS on a Windows NT workstation. I have not been able to get it to recognize that a NetWare Connect server is on the network. Am I missing something? What can I do?**



WIN2NCS intercepts calls to the Windows COMM.DRV serial driver. Windows NT uses a different process to talk to the modem and, hence, won't work with WIN2NCS.

## NetWare Connect Q & A: Access to TCP/IP with RNS

**I have configured TCP/IP to run with Remote Node Services (RNS). All I can access via the remote connection is the NetWare Connect server. How do I fix it?**

Make sure when you load the TCP/IP protocol stack on the server that you load it with the FORWARD=YES parameter. This parameter allows the NetWare Connect server to also act as an IP router. Check to see that you have the latest LAN driver and TCP/IP protocol stack for the version of NetWare that you are running NetWare Connect on. Also verify that you have the ETHERNET_II frame type bound to the RNS LAN driver and that you have a valid IP address for the RNS driver. Check the remote workstation's NET.CFG file to see if you have an IP router statement present that contains the IP address of the NetWare Connect RNS driver.

# NetWare Connect Q & A: Windows for Workgroups Use



**I have users running Windows for Workgroups v3.11. The users are reporting intermittent loss of connections to the NetWare Connect server. We are using WIN2NCS. What can I do?**



A good starting place would be to disable Microsoft's IPX/SPX-compatible protocol. Several people have reported that once this is done everything works fine.

# NetWare Connect Q & A: Dedicated Server vs. File Server Use

**I am in the process of installing NetWare Connect for my company. I plan to support four lines for both incoming and outgoing traffic. I know it is possible to run NetWare Connect on the main file server, but should it be run on a dedicated machine?**

The other NetWare Loadable Modules (NLMs) loaded on your server and the manner of use will determine whether or not you need to place NetWare Connect on a dedicated machine. If most of the use will be dialing up data services, such as CompuServe or technical support bulletin boards, then you will probably be satisfied with the performance of NetWare Connect on your server. If you will be performing frequent or substantial file transfers, you may have better performance by having NetWare Connect on dedicated hardware.

# NetWare Connect Q & A: Slow LOGIN and Application Access

**We have installed NetWare Connect using 14,400bps modems. Everything seems to be working, but it is very slow. To log into a server via NetWare Connect takes about five minutes from when a user types LOGIN to when the login process completes. To run WordPerfect takes so long that eventually the server hangs up. Users are reluctant to use NetWare Connect because of its slowness. How can I speed things up?**

From your description, you are using Remote Node Service (RNS). The secret to speed using this mode in NetWare Connect is to have everything you need to run (i.e., LOGIN, WordPerfect, etc.) loaded on your local machine and to use the dial-up line for data only. Running LOGIN remotely is not a good idea, because you have to load the terminate-and-stay-resident (TSR) programs or other executable programs contained in the login script across the remote connection.

You might want to build a DOS batch file that contains the commands you need but have these commands available locally. Running this batch file will give you the appearance of having a login script without the performance penalty of remotely executing it. Instead of using LOGIN to identify yourself to the server, you need to use the ATTACH command.

# NetWare Connect Procedure List

[Loading NetWare Connect from the Server](#)

[Loading NetWare Connect Patches from the Server](#)

## NetWare Connect Procedure: Loading NetWare Connect from the Server

1. Create a directory off of the root of the SYS: volume called NWC.

2. Create a subdirectory under this directory for each diskette needed for NetWare Connect (i.e., DISK1).

3. Copy each diskette to the appropriate subdirectory.

4. At the console prompt, type LOAD INSTALL and press the Enter key.

5. Select Product Options and press the Enter key.

6. Press the Insert key, type SYS:NWC\DISK1 for the path, and press the Enter key.

7. When prompted, insert the license diskette in drive A:.

8. When the installation is completed, proceed with the configuration of NetWare Connect.

## NetWare Connect Procedure: Loading NetWare Connect Patches from the Server

1. Create a directory off of the root of SYS: called NWCPATCH.

2. Create a subdirectory below this directory for each patch that needs to be installed (i.e., NWC001).

3. Copy the contents of the Patch disk to the appropriate directory.

4. To apply the patch, first unload NetWare Connect (NWCSTOP at the server console prompt).

5. At the server console prompt, enter LOAD INSTALL and press the Enter key.

6. Select Product Options and press the Enter key.

7. Press Insert and enter SYS:NWCPATCH\NWCxxxx (in which XXX is the patch revision number).

8. Press the Enter key to start the patch installation.

9. Repeat Steps 7 and 8 until all the patches have been applied.

## NetWare Connect Requirements

**Server requirements:**

- NetWare OS: v3.x or 4.x

- Memory: 4 megabytes (MB) of RAM above the amount that is currently installed in the server

- Disk Space: 6MB

- CD-ROM: Helps speed up installation

- AIO-compliant remote communications adapter (i.e., Hayes ESP, Digiboard, etc.)

**Client requirements:**

- DOS: DOS 3.x or later

- NetWare client software

- Remote node driver (included with NetWare Connect)

- Windows: Microsoft Windows 3.0 or later

- NetWare client software

- Remote node driver (included with NetWare Connect)

- Macintosh: Macintosh Operating System 7.0 or later

## NetWare Connect Network Utilities

[Close-Up/LAN Pro v6.1 from Norton-Lambert](#)

[CompuServe Information Manager for Windows--WinCIM 1.4 Novell Edition](#)

[CompuServe NetLauncher v1.0FCV](#)

## NetWare Connect Utilities: CompuServe Information Manager for Windows--WinCIM 1.4 Novell Edition

WinCIM is Windows-based access software for CompuServe.

To install this software, copy the directory D:\PROGRAMS\WINCIM to your hard disk. Then run the SETUP program from the Windows Program Manager File Run command line. If your hard disk is designated as drive C, type C:\WINCIM\ SETUP.EXE and choose OK.

# NetWare Connect Utilities: CompuServe NetLauncher v1.0FCV

NetLauncher is Internet access software for CompuServe.

To install this software, copy the directory D:\PROGRAMS\NETLAUNC to your hard disk. Then run the SETUP program from the Windows Program Manager File Run command line. If your CD-ROM drive is designated as drive D, type D:\NETLAUNC\SETUP.EXE and choose OK.

## NetWare Connect Utilities: Close-Up/LAN Pro v6.1 from Norton-Lambert

This evaluation is a timed evaluation that includes two fully running programs; the Close-Up modem remote communications package and the Close-Up LAN Pro network remote communications package. Users can demo the Close-Up modem product, the Close-Up/LAN Pro network product, or both products simultaneously.

A README file is included that is a quick manual and reference guide for operating both Close-Up and Close-Up/LAN Pro modem and network programs.

Requirements:

- Hardware: IBM PCs, ATs, XTs, PS/2s, and 100% compatibles.
- Operating System: MS or PC DOS 3.3 or later.
  Windows (Optional): Windows 3.1 or 3.11. Windows for Workgroups 3.11.
- Mouse (optional): Microsoft mouse and 100 percent compatibles
- Network (optional): NetWare and all popular networks
- Modems: Point and   Select from over 800 modems
- Monitors: Monochrome through SVGA
- Memory: Close-Up Host 0K (with UMB's) or 42KB, remote 375KB
  Close-Up/LAN Pro Host 0K (with UMB's) or 47KB, remote 375KB
- Hard disk: Recommended
- **Note**: Requires 2 machines to establish a remote connection

Installation:

To install, copy the directory D:\PROGRAMS\NORTON to your hard disk. Type CINSTALL at the DOS prompt.

# LAN WorkGroup

## CD HELPdesk Series: Novell Products

### Click on any icon for more information

Q+A

PROCEDURE LIST

REQUIRED

NETWORK UTILITIES

VENDOR LIST

## LAN WorkGroup Q & A


[Choices for implementing TCP/IP in My NetWare Environment](#)

[LAN WorkPlace for DOS/Windows vs. LAN WorkGroup](#)

[LSL Buffer Size Too Small Error](#)

[MLID: Error Resetting the Adapter](#)

[Pinging the Host by Name Takes a Long Time](#)

[Service Not Available Error Message](#)

[Severe Error During Installation](#)

[SFT Level III and LAN WorkGroup](#)

[Specifying Duplicate Default Routes](#)

[TCP/IP Addressing Definition](#)

[TCP/IP Defined](#)

[WGTCPIP Can't Determine IP Addresses for Token-Ring Workstations](#)

# LAN WorkGroup Q & A: Specifying Duplicate Default Routes

**I installed an additional router on the network to keep things running in case the primary router fails. LAN WorkGroup only allows me to specify one default route. Is there a way I can specify the alternate default route in LAN Workgroup?**

At the server, load LWGCON as follows: LOAD LWGCON MULTIPLE ROUTERS. This command will allow you to specify up to three default routers in the profile. It will work only with LAN WorkGroup 4.2.

# LAN WorkGroup Q & A: Service Not Available Error Message

**I have installed LAN WorkGroup on my server. When the users try to run any of the applications, they receive a "service not available" message. What's wrong and how do I fix it?**

Check to make sure that VTCPIP.386 is listed in the user's SYSTEM.INI file. This file should match the VTCPIP.386 file in the server's NET\BIN directory. You may need to copy this file into the user's WINDOWS\SYSTEM directory or modify the path to point to the servers copy of the file. Verify that the correct paths exist under the protocol TCPIP section in the NET.CFG file. These paths should point to the NET directories on the server.

## LAN WorkGroup Q & A: SFT Level III and LAN WorkGroup

**I am getting ready to upgrade my NetWare 4.1 server to SFT Level III. What changes do I need to make to LAN WorkGroup after the upgrade is in place?**

You will need to load UNISTART.NCF at the Microsoft engine layer. Load BOOTPFWD.NLM at each IOENGINE to point to the IP address of the MSENGINE. Load LWGCON at the MSENGINE layer: LOAD LWGCON MULTIPLE ROUTERS. This command will allow you to specify both of the IP addresses of the IOENGINES.

## LAN WorkGroup Q & A: WGTCPIP Can't Determine IP Addresses for Token-Ring Workstations

**We have started making LAN WorkGroup available to our token-ring workstations. We have encountered a problem in which WGTCPIP is unable to determine an IP address for these workstations. We haven't seen the problem on the Ethernet workstations on the remainder of the network. What do we need to look at?**

Check the token-ring workstations to see if they are loading TOKEN.COM. If they are, the LAN WorkGroup server will need to load ROUTE.NLM so that it will understand the source-routed requests. The other option is to not load ROUTE.COM on the token-ring workstations.

## LAN WorkGroup Q & A: Pinging the Host by Name Takes a Long Time

**Since installing LAN Workgroup, we have noticed a problem when users try to ping a host by name. The response takes two to three times longer than when the host is pinged by its IP address. Do we have something configured wrong?**

It sounds like you may be having a problem with your Domain Name Server (DNS). This process (typically running on a UNIX machine) translates the name you are trying to use to an IP address. Verify that your DNS server is operational. Check on the workstations that the TCPIP protocol stack points to the DNS server. This task is handled by the RESOLV.CFG file located in the NET\TCP directory. Check your documentation for the correct syntax to use in RESOLV.CFG.

# LAN WorkGroup Q & A: Severe Error During Installation

**When trying to WGSETUP to install LAN WorkGroup on a workstation, we received a severe error that indicated the operation couldn't continue. The message was cryptic and didn't indicate the problem. What's wrong?**

During the installation process, make sure that SHARE.EXE isn't loaded. Also verify that you have sufficient disk space to install the LAN WorkGroup files. Try unloading any other terminate-and-stay resident (TSRs) programs you may have present to see if they are causing the conflict.

## LAN WorkGroup Q & A: LSL Buffer Size Too Small Error

**After installing a workstation and running WGSETUP, I am receiving the following error message: "LSL Buffer Size Too Small" when the driver for the network adapter loads. What's the problem?**

Increase the size of the LINK BUFFER statement in the NET.CFG file. If you are using a token-ring adapter, this parameter should be set to 4202 in the LINK SUPPORT section of the NET.CFG file. You may also need to increase the number of buffers. Verify that you have the latest versions of the Open Data-Link Interface (ODI) LAN drivers for your workstation.

# LAN WorkGroup Q & A: MLID: Error Resetting the Adapter

**After installing LAN WorkGroup on a workstation, I started receiving this error when the driver for the network adapter loads: "MLID: error resetting the adapter." What do I need to look at?**

Make sure you have the latest Open Data-Link Interface (ODI) LAN drivers for this workstation. This could be a memory management-related problem. Try booting the workstation without memory management and see if the error occurs. If you still have the problem, load the network adapter driver in conventional memory. If you have no success, try the same approach with IPXODI.

# LAN WorkGroup Q & A: TCP/IP Defined

**What is TCP/IP?**

The Transmission Control Protocol/Internet Protocol (TCP/IP) is a suite of networking protocols developed in the 1970s by the U.S. Department of Defense's Defense Advanced Research Projects Agency (DARPA). TCP/IP began as a solution to connect military agencies, government, and academia together into a WAN. The smaller WAN developed into the Internet, and TCP/IP became ubiquitous throughout the Internet. (And they all lived happily ever after! )

Today, TCP/IP is becoming the most popular way to interconnect and communicate between networks because of its wide acceptance and standardization. As the popularity for TCP/IP grows, so does the support for it in systems and applications. In a world where heterogeneous environments abound, TCP/IP is the one trend we see that is following a different track-- towards a homogeneous protocol.

The following components comprise the TCP/IP protocol stack:

Internet Protocol (IP)--equivalent or similar to IPX. It provides the header information for IP addresses.

Internet Control Message Protocol (ICMP)--Detects error conditions and reports back to the sender

Address Resolution Protocol (ARP)--used for discovering hosts

Reverse Address Resolution Protocol (RARP)--used for discovering hosts

Transmission Control Protocol (TCP)--equivalent or similar to SPX

User Datagram Protocol (UDP)--used instead of TCP for connectionless datagram service

File Transfer Protocol (FTP)--file transfer from host to client

Simple Mail Transfer Protocol (SMTP)--common e-mail protocol

Telnet--terminal emulation protocol

## <u>Simple network Management Protocol (SNMP)</u>--<u>Network management protocol</u>

## LAN WorkGroup Q & A: LAN WorkPlace for DOS/Windows vs. LAN WorkGroup

**What are the differences between LAN WorkPlace and LAN WorkGroup?**

Both are products sold by Novell as solutions for client-based TCP/IP connectivity. However, LAN WorkPlace is a software package that is loaded locally onto a client's hard disk drive and is given a static IP address. Configuration and administration of the software and IP information must take place individually at the workstation.

LAN WorkGroup, on the other hand, is loaded on a NetWare file server, can be configured to dynamically allocate IP addresses, and can also be administered and configured centrally from the file server. All files and configuration files (including NET.CFG) reside on the file server, making changes to configuration a snap. How does this work? Well, a BOOTP.NLM is loaded on the file server, and an unlimited license for BOOTP relay agents is provided.

LAN WorkGroup also helps maintain control over licensing issues, since there are no files at the workstation to copy and distribute. And, finally, if users require a specific IP address for one reason or another, LAN WorkGroup permits both dynamic and static addressing. The advantage of using dynamic addressing is that it is much easier to maintain and requires fewer numbers to administer.

## LAN Workgroup Q & A: Choices for Implementing TCP/IP in my NetWare Environment



**What are my choices for implementing TCP/IP in my NetWare environment?**



You have three methods of implementing TCP/IP in a NetWare environment:

Client-based--involves loading the TCP/IP protocol stack locally (gloss IP +IPX). This method requires use of the Open Data-link Interface (ODI) stack on the client for support of multiple protocols. Novell offers LAN WorkPlace as a client-based IP solution.

Gateway-based--involves installing a TCP/IP gateway. Clients need not load IP locally, but can communicate using IPX to the gateway, allowing the gateway to convert the IPX packets to IP packets for further transmission. Novell does not offer a TCP/IP gateway product.

Host-based--involves loading the TCP/IP protocol stack on the host. Novell provides a product called NetWare IP that essentially allows a NetWare host and client to use IP and can eliminate the use of IPX, if the organization so desires.

In addition to the above methods, NetWare v3.1x and 4.x file servers support the routing of IP traffic. This means that the servers can route the IP traffic through the servers. However, the clients can't communicate with the file server simply with the routing enabled. The server must be running NetWare IP in order for that to work.

# LAN Workgroup Q & A: TCP/IP Addressing Definition

**How do TCP/IP addresses work?**

TCP/IP requires unique addresses for hosts and workstations. If you never plan to connect to the Internet, you can devise your own address numbering scheme, as long as you follow the IP address syntax. However, if you do plan to connect to the Internet, you must obtain a range of Internet addresses for your company. Some firewalls to the Internet can shield you from having to use proper Internet addresses, but you should still understand how it works before implementing your scheme.

IP, like IPX, requires a source and a destination address when sending data across a network. You can break an IP address down in terms of NetWare to better understand how IP works. An IP address is divided into two parts: the network address and the local address. The network address is a mask and is comparable to a NetWare network address. The local address is comparable in use to a NetWare node address.

The main difference between IP and IPX in this manner is that, for IP, the network address is different depending on which class of Internet addresses you've been assigned or are using.

IP addresses are assigned using three class distinctions: Class A, B, and C. Using the next line as a reference, we'll discuss how IP addressing is assigned based on class:

   WWW.XXX.YYY.ZZZ (i.e., 193.9.1.3)

Class A addresses, which are assigned to ARPANET, MILNET, IBM, DEC, AT&T, and other major network participants, can use the decimal range of 0-127 (except 0 and 125, which are reserved) for WWW (network address). The local address then can use the XXX.YYY.ZZZ bytes for addressing. The total number of local addresses is a whopping 16,777,214!

Class B addresses, reserved for very large companies, and very difficult to obtain, can use the decimal range of 128-191 for WWW. The network address in Class B range uses the WWW.XXX bytes, with local addresses using the YYY.ZZZ bytes. You can see how this scheme changes the numbers a little: There are 16,384 network addresses and 65,024 local addresses.

Class C addresses, assigned to most companies, can use the decimal range of 192-223 for WWW. In Class C addresses, the WWW.XXX.YYY bytes are reserved for the network address and the ZZZ bytes are reserved for the local addresses. Using this numbering scheme, there are allotments for 2,097,152 network addresses, each with 255 local addresses.

# LAN WorkGroup Procedure List

[Installing from Diskette](#)

[Installing on a Client Workstation](#)

# LAN WorkGroup Procedure: Installing from Diskette

1. Load TCP/IP and bind IP to the network adapter(s) in the server.

2. At the server console prompt, type LOAD INSTALL and press the Enter key.

3. Select Product Options and press the Insert key.

4. Press the Enter key to begin installation.

5. Press Esc to continue.

6. Select N to not stop the installation and press the Enter key.

7. Verify the local host name to use, change if necessary and press the Enter key.

8. Select the volume to install on and press the Enter key (SYS is recommended).

9. Insert additional disks as needed.

10. Press Esc at Congratulations message.

11. Press Esc.

12. Exit the INSTALL.NLM.

13. At the server console prompt, type NFSSTART to enable LAN WorkGroup and press the Enter key.

14. Fill out the Planning Worksheets.

15. At the server's console prompt, type LOAD LWGCON and press the Enter key.

16. Use the Planning Worksheets to fill in the information requested by LWGCON.

17. Add this line to the login script: INCLUDE SYS:PUBLIC\SYSLOGIN.LWG

18. Depending on the number of users needing LAN WorkGroup, you may want to put a conditional statement around Step 17 to restrict it to working with the desired individuals of a group.

# LAN WorkGroup Procedure: Installing on a Client Workstation

1. Verify the CONFIG.SYS file for files=40 and buffers=20 as minimum statements.

2. If using SHARE.EXE, temporarily disable this command until after LAN WorkGroup has been installed on this client.

3. Before logging into the server, get your workstation type from the LAN administrator.

4. Log into the server.

5. Type WGSETUP workstation_type (replace this with the type given to you in Step 3) and press the Enter key.

6. If no workstation type is entered, you will be prompted about using the default workstation type.

7. Press Y and the Enter key if this is appropriate.

8. The installation of LAN WorkGroup will proceed.

9. Press Esc when prompted that the installation is complete.

10. Reboot the workstation and test the installation.

11. When logging into the server, you will be prompted about loading the LAN WorkGroup software.

12. Press Y and the Enter key.

## LAN WorkGroup Requirements

**Server requirements:**

- NetWare v3.x or NetWare 4.x

- Disk space required: 4.5 megabytes (MB)

**Client requirements:**

- DOS: DOS 3.1 or later

- Windows: Microsoft Windows 3.0 or later, DOS 3.1 or later (optional)

- DeskVIEW (optional)

- Network adapter with Open Data-Link Interface (ODI) driver that supports TCP/IP

## LAN WorkGroup Network Utilities

[Close-Up/LAN Pro v6.1 from Norton-Lambert](#)

[CompuServe Information Manager for Windows--WinCIM 1.4 Novell Edition](#)

[CompuServe NetLauncher v1.0FCV](#)

## LAN WorkGroup Utilities: CompuServe Information Manager for Windows--WinCIM 1.4 Novell Edition



WinCIM is Windows-based access software for CompuServe.

To install this software, copy the directory D:\PROGRAMS\WINCIM to your hard disk. Then run the SETUP program from the Windows Program Manager File Run command line. If your hard disk is designated as drive C, type C:\WINCIM\ SETUP.EXE and choose OK.

# LAN WorkGroup Utilities: CompuServe NetLauncher v1.0FCV

NetLauncher is Internet access software for CompuServe.

To install this software, copy the directory D:\PROGRAMS\NETLAUNC to your hard disk. Then run the SETUP program from the Windows Program Manager File Run command line. If your CD-ROM drive is designated as drive D, type D:\NETLAUNC\SETUP.EXE and choose OK.

## LAN WorkGroup Utilities: Close-Up/LAN Pro v6.1 from Norton-Lambert

This evaluation is a timed evaluation that includes two fully running programs; the Close-Up modem remote communications package and the Close-Up LAN Pro network remote communications package. Users can demo the Close-Up modem product, the Close-Up/LAN Pro network product, or both products simultaneously.

A README file is included that is a quick manual and reference guide for operating both Close-Up and Close-Up/LAN Pro modem and network programs.

Requirements:

- Hardware: IBM PCs, ATs, XTs, PS/2s, and 100% compatibles.
- Operating System: MS or PC DOS 3.3 or later.
  Windows (Optional): Windows 3.1 or 3.11. Windows for Workgroups 3.11.
- Mouse (optional): Microsoft mouse and 100 percent compatibles
- Network (optional): NetWare and all popular networks
- Modems: Point and   Select from over 800 modems
- Monitors: Monochrome through SVGA
- Memory: Close-Up Host 0K (with UMB's) or 42KB, remote 375KB
  Close-Up/LAN Pro Host 0K (with UMB's) or 47KB, remote 375KB
- Hard disk: Recommended
- **Note**: Requires 2 machines to establish a remote connection

Installation:

To install, copy the directory D:\PROGRAMS\NORTON to your hard disk.
Type CINSTALL at the DOS prompt.

## LAN WorkPlace



CD HELPdesk Series: Novell Products

Click on any icon for more information

## LAN WorkPlace Q & A

[BOOTP Over a SLIP Connection](#)

[BOOTP vs. RARP](#)

[ImplementingTCP/IP at a Workstation](#)

[Kermit for DOS Use in DOS Windows](#)

[Keyboard Mapping](#)

[Losing TN3270 Session in Windows](#)

[RS/6000 Connections](#)

[Running Novell's TCP/IP Stack without Using a DOS TSR](#)

# LAN WorkPlace Q & A: Losing TN3270 Session in Windows

**I have a user with a problem in TN3270 and who keeps getting kicked out of the session back to Windows and receives the message tcpip panic (0033) and Microsoft Windows POPUP program support'. Once in a while, a system integrity error' message appears in Windows. After getting either errors, the user can not execute TN3270 and the PC has to be rebooted. Do you have any suggestions?**

It sounds as if you are having a dynamic link library (DLL) problem in Windows. Download LWP207.EXE and LWP208.EXE from NetWire on CompuServe and apply these files to your configuration. They will update Windows to the latest drivers for Windows and DOS. If you are still having a problem, you may need to install a fresh copy of Windows on this workstation to a different directory and then install LAN Workplace again. After this is done, check the SYSTEM.INI and WIN.INI files to see what is different. You may have to try commenting out the lines that are different between the two copies of the files until you find the offending .DLL or .386 file that is causing the problem.

# LAN WorkPlace Q & A: BOOTP Over a SLIP Connection

**I can't get a BOOTP request to work with Novell's TCP/IP stack from LAN WorkPlace over a SLIP connection. This same type of configuration works fine when the workstation is connected to the network via a direct Ethernet cable. Shouldn't this work?**

The Serial Line Internet Protocol (SLIP) is a point-to-point link in which the Address Resolution Protocol (ARP) hardware addresses   and gateways don't function. BOOTP is based on the relationship in a table between the Media Access Control (MAC) address of a network adapter and a predefined IP address. Serial ports don't have MAC addresses. You can try using a NODE ADDRESS statement in the NET.CFG file, but this may or may not work depending on how you are calling the remote system. If you are dialing in through a terminal server, you might try using an IP address of 0.0.0.0 and see if the terminal server might dynamically assign an IP address.

# LAN WorkPlace Q & A: Kermit for DOS Use in DOS Windows

**I have a Novell 3.12 network in which users need to talk to a UNIX box. We have been using Kermit for DOS. It does not seem run well in DOS Windows. I have already tried the Windows version of Kermit but had no luck.**

You might want to look at Novell's LAN WorkPlace for DOS5 5.0. After adding the LWP207/208 patches, you will have added WINSOCK.DLL support for Windows. More applications for TCP/IP networks are being written to the WINSOCK.DLL standard, which allows them to run on more than one vendor's IP protocol stack. Depending on how many of your users need access to the UNIX box, you may want to look at LAN WorkGroup instead. The difference between the two products is that the administration and assignment of IP addresses occurs at the server. This can prevent headaches when the wrong NET.CFG file is copied to a workstation, which could give the same IP address to more than one workstation. LAN WorkPlace 5.0, released while this CD was being written, is the latest version that ships with WINSOCK support.

# LAN WorkPlace Q & A: Implementing TCP/IP at a Workstation



**What do I need to do to implement TCP/IP at a workstation?**



You need to purchase LAN WorkPlace for DOS or Windows, since it does not ship with NetWare.

You need to make sure that the workstation is using the Open Data-link Interface (ODI) drivers, which support multiple protocols such as IPX and gloss IP . This will involve removing IPX.COM from any workstation you plan to install TCP/IP on and replacing it with IPXODI.COM, LSL.COM, and the LAN adapter driver (i.e., NE2000.COM, TOKEN.COM, etc.).

You will need to assign a unique TCP/IP address to the workstation. This address should follow your organization's addressing scheme (i.e., don't make it just any arbitrary address).

You will need to change any batch files you have that execute the workstation's bootup and login process to reflect the use of new ODI drivers. The drivers should load as follows:

        LSL                     (Link Support Layer)
        NE2000                  (Link Driver)
        IPXODI                  (Packet Driver)

You will need to edit the workstation's NET.CFG file to tell it you will be using TCP/IP, and add configuration information that can look like the following portion of a NET.CFG file. (Note: we did not take the entire contents of the NET.CFG file; specifically, we cut off the tail-end of the Protocol TCP/IP portion):

    Link Support
            Buffers 8 1500
            MemPool 4096
            Link Driver NE2000
            Int 5
            Port 320
            Frame Ethernet_II
            Frame Ethernet_802.3
            Protocol IPX 0 Ethernet_802.3
            Protocol TCP/IP
            Path Script    C:\TCPIP\SCRIPT

```
Path Profile   C:\TCPIP\PROFILE
Path LWP_CFG      C:\TCPIP\HSTACC
Path TCP_CFG      C:\TCPIP\TCP
ip_address   193.1.2.3
ip_router              193.1.2.254
ip_netmask   255.255.255.0
```

Just as you have to load the ODI drivers that include IPX, you'll also need to load
the TCP/IP stack, which usually means executing a file called TCP/IP.EXE.

Let's briefly describe each of these sections, mentioned in Item 5 above, that
appear in the NET.CFG file:

Link Support--LSL.COM uses this section of the NET.CFG file and uses the
Buffer (size of incoming packets area) and Mempool (size of outgoing packets
area) settings.

Link Driver--NE2000.COM (from our example) uses this section of the NET.CFG
file to identify the frame type and protocols. Note that there are two Ethernet
frame types specified: one is for IPX's use and the other is used by TCP/IP.

Protocol TCP/IP--This section of the NET.CFG file stores information about
where to locate the configuration and script files. It also identifies the
workstation's TCP/IP address, as well as other information.

# LAN WorkPlace Q & A: RS/6000 Connections

**We are currently using LAN WorkPlace to connect to an IBM mainframe using 3270 emulation. Can we also use LAN WorkPlace to connect to an RS/6000?**

Yes. To connect to the RS/6000, you will telnet using the host presenter. You can use LAN WorkPlace to access both hosts from the same package, as LAN Workplace is licensed by the number of users and not the number of hosts being accessed.

# LAN WorkPlace Q & A: Keyboard Mapping

**We are moving users from dumb terminals to PCs. Is there a way we can remap the keyboard on the PC to the terminal keyboard layout when the users are in LAN Workplace's Host Presenter?**

Yes. Download a file called KEYMAP.TXT from the NOVLIB forum on CompuServe. This file contains several examples that should help you set up the keyboard layout.

## LAN WorkPlace Q & A: Bootp vs. RARP

**What is the difference between Bootp and RARP?**

In Bootp, a workstation sends a request to find its IP address. When the Bootp server responds, the workstation also learns the nameserver and gateways it should use. All IP addresses, nameserver, and gateway information are kept in a single file on the Bootp server.

The Reverse Address Resolution Protocol(RARP) is less sophisticated than Bootp. In RARP, the workstation only receives the IP address it will use. RARP messages are not passed through Novell servers or routers, as Bootp messages are.

# LAN WorkPlace Q & A: Running Novell's TCP/IP Stack without Using a DOS TSR

**How can I run Novell's TCP/IP stack without using a TSR?**

As long as Novell supports DOS and Windows workstations with a single driver, you will have to use a terminate-and-stay-resident (TSR) program to use the TCP/IP stack. As the NetWare installed base moves to Windows 95 and other 32-bit desktop operating systems, you will see Novell start to move away from TSR-based client software.

# LAN WorkPlace Procedure List

[Configuring the Host Presenter to Auto-Load Profile](#)

[Installing LAN WorkPlace 5.0 from a CD-ROM](#)

## LAN WorkPlace Procedure: Installing LAN WorkPlace 5.0 from a CD-ROM

1. Have client ODI drivers installed.

2. Start Windows.

3. Press Alt-F, Run.

4. Type D:INSTALL (where D is the CD-ROM drive letter) and press the Enter key.

5. Select Continue and press the Enter key.

6. Verify the directory name and drive letter.

7. Select OD and press the Enter key.

8. Select Configure and press the Enter key to configure LAN WorkPlace or select Exit to configure it later.

9. Prior to Selecting Configure, fill out the Configuration Workbook.

10. The product is installed.

## LAN WorkPlace Procedure: Configuring the Host Presenter to Auto-Load Profile

1. At the DOS prompt, type WIN and press the Enter key.

2. Double click on the LAN WorkPlace 5 group if it isn't already open.

3. Double-click on the Host Presenter icon.

4. Click on Cancel.

5. Click on Setup.

6. Enter Host Name or IP Address in Hostname box.

7. Enter the host name or something descriptive about the host .

8. Click on Profile, drag mouse down to Save As and release the button.

9. Enter a name for the .PHP file and press the Enter key.

10. Click on Cancel.

11. Double-click in the upper left hand corner of Host Presenter to close.

12. Click on File, Copy.

13. Change on the Group box to reflect LAN WorkPlace 5.

14. Click on OK.

15. Click on File, Properties.

16. Click in the Description box and change the label to reflect the host name your are customizing it for.

17. Click on the Command Line box and press the End key.

18. Press the Space bar one time.

19. Type /PROFILE:C:\NET\PROFILE\HOST1.PHP (change HOST1 to the name you used in Step 9).

20. Click on OK to save.

21. You now have a customized icon ready to use for a specific host.

## LAN WorkPlace Requirements

**Client requirements:**

- DOS: DOS 3.1 or later

- Windows: Microsoft Windows 3.0 or later, DOS 3.1 or later

- DeskView (optional)

- Network adapter with an ODI driver that supports TCP/IP

- Disk space: 1MB for DOS or 4MB for Windows

## LAN WorkPlace Network Utilities

[Close-Up/LAN Pro v6.1 from Norton-Lambert](#)

[CompuServe Information Manager for Windows--WinCIM 1.4 Novell Edition](#)

[CompuServe NetLauncher v1.0FCV](#)

## LAN WorkPlace Utilities: CompuServe Information Manager for Windows--WinCIM 1.4 Novell Edition

WinCIM is Windows-based access software for CompuServe.

To install this software, copy the directory D:\PROGRAMS\WINCIM to your hard disk. Then run the SETUP program from the Windows Program Manager File Run command line. If your hard disk is designated as drive C, type C:\WINCIM\ SETUP.EXE and choose OK.

## LAN WorkPlace Utilities: CompuServe NetLauncher v1.0FCV

NetLauncher is Internet access software for CompuServe.

To install this software, copy the directory D:\PROGRAMS\NETLAUNC to your hard disk. Then run the SETUP program from the Windows Program Manager File Run command line. If your CD-ROM drive is designated as drive D, type D:\NETLAUNC\SETUP.EXE and choose OK.

## LAN WorkPlace Utilities: Close-Up/LAN Pro v6.1 from Norton-Lambert

This evaluation is a timed evaluation that includes two fully running programs; the Close-Up modem remote communications package and the Close-Up LAN Pro network remote communications package. Users can demo the Close-Up modem product, the Close-Up/LAN Pro network product, or both products simultaneously.

A README file is included that is a quick manual and reference guide for operating both Close-Up and Close-Up/LAN Pro modem and network programs.

Requirements:

- Hardware: IBM PCs, ATs, XTs, PS/2s, and 100% compatibles.
- Operating System: MS or PC DOS 3.3 or later.
  Windows (Optional): Windows 3.1 or 3.11. Windows for Workgroups 3.11.
- Mouse (optional): Microsoft mouse and 100 percent compatibles
- Network (optional): NetWare and all popular networks
- Modems: Point and  Select from over 800 modems
- Monitors: Monochrome through SVGA
- Memory: Close-Up Host 0K (with UMB's) or 42KB, remote 375KB
  Close-Up/LAN Pro Host 0K (with UMB's) or 47KB, remote 375KB
- Hard disk: Recommended
- **Note**: Requires 2 machines to establish a remote connection

Installation:

To install, copy the directory D:\PROGRAMS\NORTON to your hard disk. Type CINSTALL at the DOS prompt.

# Glossary

A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
P
Q
R
S
T
U
V
W
X
Y
Z

**A**

[Access rights](#)
[Across-the-Wire](#)
[Ad hoc](#)
[ADMIN](#)
[Administrator](#)
[Algorithms](#)
[America Online](#)

American National Standards Institute (ANSI)
Anti-virus
APPLE.EXE
AppleShare
AppleTalk
Application Layer
Application Notes
Application program interface
AppWare
AppWare Loadable Modules
Archie
Archive bit attribute
ARPANET
Authenticated
Authentication
AUTOEXEC.BAT
AUTOEXEC.NCF


**B**

Bandwidth
Base I/O addresses
Battery backup
Benchmark
Bindery
Bindery emulation
BINDFIX
BINDREST
BIOS
Bitmap
BOOTPFWD.NLM
Bridge
Broadcast
Btrieve
Buffers


**C**

C-Worthy interface
Cache
CAPTURE
Category 4
Category 5
CCITT

**N**

[NBACKUP](#)
[NET ADMIN](#)
[NET.CFG](#)
[NETADMIN](#)
[NETUSER](#)
[NetWare Connect](#)
[NetWare Core Protocol (NCP)](#)
[NetWare Directory Services](#)
[NetWare for SAA](#)
[NetWare Loadable Module (NLM)](#)
[NetWare Runtime](#)
[NetWare shell](#)
[NetWare v3.11](#)
[NetWire](#)
[Network adapter](#)
[Network address](#)
[Network-aware](#)
[Network management](#)
[Network Management Agent](#)
[NETX shell](#)
[Newsgroup](#)
[News reader](#)
[NLMIGRAT](#)
[Node address](#)
[NPRINT](#)
[NPRINTER.EXE](#)


**O**
[OBJECT ID](#)
[Open Data-Link Interface (ODI)](#)
[Open Shortest Path First (OSPF)](#)
[Organizational Unit](#)
[OSI Model](#)


**P**

[Packet burst](#)
[Packets](#)
[Parallel processing](#)
[PBURST.NLM](#)
[PCONSOLE](#)
[Peer](#)

**T**

**U**

**V**

**W**

**X**

**Y**

**Z**

## Access rights

Files and directories have access rights that control their use. The NetWare access rights are access control, create, erase, file scan, modify, read, supervisory, and write. Access rights are also known as trustee rights.

## Across-the-Wire

Across-the-Wire is a form of upgrading from any version of NetWare across the network media.

## Ad hoc

In an Ad hoc standard, all changes are made for a particular purpose.

## ADMIN

In NetWare 4.x, ADMIN replaces the SUPERVISOR account. ADMIN is automatically created on installation and has the responsibility to create the network's directory structure.

## Administrator

The administrator is known as ADMIN in NetWare 4.x and SUPERVISOR in NetWare v3.x.

# Algorithms

Algorithms are mathematical structures used to develop computer programs.

## America Online

America Online is a commercial online service, similar to CompuServe, that provides e-mail, file services, and other material to subscribers over phone lines or the Internet.

## American National Standards Institute (ANSI)

The American National Standards Institute (ANSI) publishes networking and communications standards, such as the Fiber Distributed Data Interface (FDDI). ANSI is the U.S. representative to the International Standards Organization (ISO).

## Anonymous FTP

Anonymous FTP is a method of retrieving a file from a remote server without having to identify who you are. It provides file transfer capabilities to anyone on the Internet. An FTP server is set up with an anonymous account, which has no password. This allows anyone on the Internet to access files on the system.

## ANSI

ANSI is responsible for standards in programming, communications, and networking.

## Anti-virus

An anti-virus program or hardware is used for detecting and/or removing a computer virus from a machine or network.

## APPLE.EXE

APPLE.EXE is the protocol stack required for AppleTalk traffic to be seen by a workstation running LANalyzer for Windows.

## AppleShare

AppleShare is the networking standard for Apple computers. It uses the AppleTalk networking protocol suite.

## **AppleTalk**

AppleTalk is a proprietary communications protocol used by Apple for Macintoshes and Apple computers.

## Application Layer

The seventh layer of the OSI Model, the Application Layer, is responsible for providing applications access to the network. Applications such as file transfer reside at this layer.

## Application Notes

The *Application Notes* are monthly publications by Novell on technical subjects.

## Application program interface

Application Program Interfaces (APIs) consist of function calls that allow programmers to interact with the operating system's services. APIs exist for a number of specifications and interfaces, such as the Telephony Services API and Microsoft's Messaging Application Program Interface (MAPI).

## AppWare

AppWare is Novell's fifth-generation programming language (also called a 5GL) that requires no lines of code to be written. In AppWare, every action is performed by linking objects together.

## AppWare Loadable Modules

AppWare Loadable Modules consist of components that allow additional functions to be used in programs written in AppWare.

## Archie

Archie is an Internet service used to locate desired resources.

## Archive bit attribute

When the archive bit attribute is present on a file, it indicates that the file is new or has been changed since the last time a full backup was performed.

# ARPANET

ARPANET is the foundation for the network now known as the Internet.
It stands for Advanced Research Projects Agency Network. The ARPANET was
the first packet-switched network.

## Authenticated

Authentication is used in NetWare to determine if the user name and password match. In NetWare 4.x, authentication uses digital signatures.

## Authentication

Authentication is the technique used by an operating system to verify the user name and password of a user.

# AUTOEXEC.BAT

The AUTOEXEC.BAT file is a batch file used in a DOS environment that automatically runs at boot up and sets the environment variables and run programs or other batch files.

# AUTOEXEC.NCF

The AUTOEXEC.NCF file loads the LAN drivers and other modules required to activate the server.

## Bandwidth

Bandwidth refers to the amount of traffic the network cable can handle at any given time. It is measure in bits per second. For example, Ethernet has a theoretical bandwidth of 10 megabits per second.

## Base I/O addresses

The base I/O address refers to an address in memory in which data is stored. The processor uses this location to address the device.

## Battery backup

Battery backup is a source of power that can temporarily stand in when commercial power is lost.

## Benchmark

Benchmarks are a series of statistics and information that serve as a basis for comparison.

## Bindery

The bindery is a database maintained by a NetWare v2.x or v3.x server. It holds information on user names, passwords, attributes, and other devices on the network.

## Bindery emulation

NetWare v2.x and v3.x contain a database called the bindery that includes information on users and resources on the network. In NetWare 4.x, NetWare Directory Services replaces the bindery. NetWare v2.x and v3.x users attaching to a NetWare 4.x network use bindery emulation.

## BINDFIX

BINDFIX is a Novell-supplied utility can fix bindery-related problems and allow a backup copy of the binderies to be copied to diskette.

## BINDREST

BINDREST is a command line utility that restores previous versions of bindery files (.OLD) over the bindery files currently being used by the server after the bindery has been damaged and repaired.

## BIOS

Basic Input/Output System. The BIOS consists of the firmware in a personal computer used to identify and control the primary attached devices, including the monitor and keyboard.

# Bitmap

A bitmap is a graphics format used to display pictures and drawings on a computer.

## BOOTPFWD.NLM

BOOTPFWD.NLM is a Novell-supplied NetWare Loadable Module (NLM) used to forward the BOOTP request through a NetWare server to the designated BOOTP server, which knows the IP address of the workstation. The BOOTPFWD.NLM allows a workstation to obtain an IP address from the server.

## Bridge

A bridge is an internetworking device that provides a communications pathway between two or more network segments. A bridge can be used to join similar or dissimilar LAN segments. It operates at the Data-Link Layer of the OSI Model.

## Broadcast

A broadcast is a file server console command that sends a message to all workstations connected to the server.

# Btrieve

Btrieve is a network database application and specification originally developed by SoftCraft and later acquired by Novell. It is now being developed further by Btrieve Technologies.

## Buffers

Buffers are temporary storage locations for storing information in memory.

## C-Worthy interface

C-Worthy is a design tool that application developers use to develop applications such as DOS menu utilities or NetWare Loadable Modules that have the distinctive NetWare look.

## Cache

Cache is a specified amount of memory that has been reserved to temporarily hold information that is frequently used.

# CAPTURE

CAPTURE is a NetWare command line utility that allows you to redirect print output to a NetWare print queue or file.

## Category 4

Category 4 is an unshielded twisted-pair cable specification that defines the type of cable certified for 16 megabits per second (Mbps) transmission rates. It uses four pairs of twisted-pair cable.

## Category 5

Category 5 is an unshielded twisted-pair cable specification that defines the type of cable certified for 100 megabits per second (Mbps) transmission rates. It uses four pairs of twisted-pair cable.

## CCITT

The Consultative Committee for International Telegraphy and Telephony (CCITT) is a subcommittee of the International Telecommunication Union (ITU) responsible for various telecommunications standards.

## Character-oriented

Character-oriented refers to an application that contains only character and no graphic information. It is also a data transmission method that defines character-based transmission as opposed to bit-oriented transmission.

## CICS

CICS refers to IBM's Customer Information Control System.

## Clock cycles

A clock cycle consists of an address cycle and a data cycle. It is the smallest unit of time recognized by a CPU. Clock cycles are also known as a clock tick.

## CompuServe

CompuServe is a commercial online service designed to provide e-mail, file, and related services to subscribers.

## CONFIG.SYS

The CONFIG.SYS file is used in DOS environments to set various DOS resources, establish default system states, and load device drivers for hardware on boot up.

## CONLOG.NLM

CONLOG.NLM is a utility that lets you capture the NetWare file server console screens to a file for viewing later.

## Connectionless datagram

A connectionless datagram is used as a best effort transmission method. The datagram does not perform error checking or recovery or guarantee delivery. It is the responsibility of the receiver to recover and request a new transmission.

# Container

A container is an object that can contain other objects in NetWare Directory Services (NDS).

## Context

The context is the area of the directory tree in which you are attempting login. If you are in the wrong context, you will receive an error message that will not allow you to log in. You can change your context using the CX command.

# CX

CX changes the context in NetWare 4.x.

## Data model

The data model is the structure of data within a data set.

## Data structure

The data structure is the organization of data within an application.

## Database Management System (DBMS)

A DBMS allow users to program applications that will access and organize data.

## Dedicated

A dedicated server is used only as a server to provide file and print services, not as a workstation.

## Default

The default value is used when an overriding value hasn't been specified.

## Demirror

In a NetWare file server, two disks may be attached to the same disk channel. All data that is written to one disk is written to the other. This is called "mirroring." The process of unmirroring or demirroring the drives so they act independently is performed from the NetWare INSTALL utility.

## Destination

The destination address is the network address of the adapter receiving a network packet.

## Dial-up link

A dial-up link is a temporary connection established via asynchronous modems.

## Directory entry

A directory entry in the directory entry table (DET) specifies the location of a file or subdirectory on a volume.

## Directory Entry Table (DET)

The DET contains directory information for the volume. NetWare maintains two copies of the DET to guard against corruption.

## Directory services

NetWare Directory Services is a hierarchical database that contains information on the objects, containers, and organizational units across an enterprise network. It provides a global naming service for logical and physical objects. NDS is used by NetWare 4.x, but offers backward compatibility to NetWare v3.x networks via bindery emulation.

## Directory tree

The Directory tree represents the NetWare 4.x directory. Its hierarchical structure contains a root, branches, and finally, leaves.

## Disk controller

A disk controller is a hardware and firmware device that controls access to hard drives and allows information to be transferred to and from the hard disk drives present in the server or workstation.

## Download

To download files consists of transferring files from the source to your location.

## Downsizing

Downsizing refers to either rewriting applications from running on a mainframe to running on a smaller environment or reducing the network of a business from a mainframe environment to a LAN environment.

## Downtime

Downtime is the amount of time a server is not able to be used.

## Drive mapping

A drive mapping allows a user to define a directory path as a logical drive in his or her environment. For example, drive G may be defined as G:\USERS\JANE\QUATTRO.

## Drivers

A driver is a piece of software that acts as an interface between software and a particular piece of hardware. It is a small computer program designed to interact with hardware to provide an interface to the computer BIOS.

## Duplexing

Duplexing is a NetWare fault-tolerant enhancement. A disk-duplexing configuration consists of duplicate disk controllers with duplicate disks, one on each controller. The data is simultaneously written to each controller.

## Dynamic Link Library (DLL)

DLLs are used by Windows programs to call functions that aren't specifically written into the base program.

## EDIT.NLM

The EDIT NetWare Loadable Module (NLM) allows you to edit the AUTOEXEC.NCF, STARTUP.NCF files, or any other file.

## E-mail

E-mail stands for electronic mail, an application that allows users to send messages and files to each other across network.

## EISA

EISA stands for Extended Industry Standard Architecture, a 32-bit bus architecture developed by Compaq and several other companies to increase speed across the bus and allow software setup of the machine.

## Electronic Software Distribution

Electronic Software Distribution (ESD) is the ability to distribute software to a workstation over the network without physically having to go to the workstation to install the software

## Emergency response team

An emergency response team is a special group of individuals that responds in highly critical network situations such as a flood or fire.

## Enterprise

An enterprise network connects all locations of an organization.

## Ethernet

Ethernet is a network access method originally created by Xerox and Digital Equipment; it was codified into a standard when the IEEE promulgated regulations in the 802.3 committee. This access method uses the Collision Sense Multiple Access with Collision Detection (CSMA/CD) protocol. In CSMA/CD, workstations on the network listen for traffic on the wire before transmitting data. In the event that two workstations transmit data at the same time, a collision occurs. Both workstations back off for a random amount of time, before attempting to transmit again. Ethernet networks operate at 10/100Mbps, and use bus or star topologies.

## ETHERNET_II

ETHERNET_II is the original Ethernet frame format. It assigns a unique packet header that is used on AppleTalk Phase I or TCP/IP networks.

## ETHERNET_802.3

ETHERNET_802.3 is the default frame type used in NetWare v2.x and NetWare v3.11.

## Eudora

Eudora is a popular Internet e-mail package that has both commercial and shareware versions.

## Fake root

A fake root is a drive mapping in NetWare that allows the user to see a subdirectory as the root directory.You would use a fake root with applications you want to install in a subdirectory that insist they are installed in the root directory.

## FAQ

A FAQ is a document that answers Frequently Asked Questions about subjects.

# Fault-tolerance

Fault-tolerance consists of steps that can be taken to avoid disruption in network operations.

## FCONSOLE

NetWare v2.x contains a menu utility called FCONSOLE that allows you to look at file server configuration and statistical information.

## Fiber-optic cable

Fiber-optic cable transmits a light signal through a glass fiber. The fiber cable consists of the glass core, the outer cladding used to reflect the light back into the core, and an outer protective jacket.

## File Allocation Table (FAT)

The File Allocation Table is the file system DOS and use to store and retrieve files.

## FILER

FILER is a Novell-supplied utility to help with the management of files and directories on the server.

## Firewall

A firewall is a device or technique to keep users of an outside system from accessing a system. It is generally used in TCP/IP networks that have access to the Internet to stop other users from entering their systems.

## FLAG

FLAG is a NetWare command used to assign attributes and rights to files and directories.

## Forum section

CompuServe consists of a number of services that provide areas called forums for discussions on a variety of topics. Forums also include libraries in which files and information pertinent to the forum are stored. An example of a forum is the *NetWare Solutions* forum on CompuServe, which may be accessed by typing GO NWSFORUM at any CompuServe prompt.

# Frame types

Frame types determine how data is packaged when it is sent across the network. They define the format of a packet on a network and follow a set of communications protocols for size and structure.

## FTP

File Transfer Protocol. FTP is a communications protocol used to transfer files on a TCP/IP (Transmission Control Protocol/Internet Protocol) network.

## Gateway

A gateway is a computer system or other device that acts as a translator between two systems that do not use the same communication protocols.

## Global MHS

NetWare Global MHS consists of NetWare Loadable Modules that allow mail delivery between MHS-based NetWare v3.x or later networks. MHS is a store-and-forward message delivery system that is used for mail, scheduling, fax, and calendar applications.

## Greenwich Mean Time

Greenwich Mean Time is also known as Universal Coordinated Time (UCT).It is the base time set up by the United Nations as the standard from which all other time zones derive.

## Host machine

A host machine is another name for a mainframe or UNIX box, or any server in a client-server network. It is also used to describe the machine used for remote control or remote access.

## Hosts

The term host refers to any machine that serves clients, such as in a host-terminal or client-server environment.

## Hot Fix Redirection Area

When NetWare attempts to write data to disk and discovers a bad sector on the disk, it employs Hot Fix, which allows the redirection of data to a known good area on the drive known as the Hot Fix Redirection Area.

## Hot-swappable

Hot-swappable defines the ability to swap hard drives without downing and powering off the file server, hub, or other device.

## Hypertext

Hypertext is a method of providing a link that can be clicked on to jump to another area of interest in an authoring or multimedia system or within the Internet's World Wide Web.

## IDE

IDE stands for Integrated Drive Electronics. An IDE controller resides on the drive. Data transfer rates can be as high as 2 megabytes per second (MBps).

## In-Place Upgrade

The In-Place Upgrade allows you to upgrade from NetWare v2.x to NetWare v3.x or NetWare v3.x to NetWare 4.x on the same server.

## INETCFG.NLM

INETCFG.NLM is a Novell-supplied NetWare Loadable Module (NLM) that streamlines the loading of LAN drivers.

## INSTALL.NLM

The INSTALL NetWare Loadable Module (NLM) is found on NetWare v3.x and 4.x servers and allows for modifications to be made to the .NCF files: creating volumes, installing new products on the server, etc.

## INT14

INT14 is an interrupt that has been reserved for the redirection of serial data to a network adapter.

## Integrated Services Digital Network

The Integrated Services Digital Network (ISDN), provides the ability to send voice, data, and other services on the same cable.

## Intelligent hubs

Intelligent hubs are wiring hubs that possess a degree of intelligence that allows them to provide enhanced functionality or be managed by a network management application.

## Interactive session

An interactive session requires input from the user.

## Internet

The Internet is a network that allows unlike machines in disparate areas to communicate via the Internet Protocol (IP).

## Internet Service Provider

The Internet is a collection of networks in disparate areas and composed of different machine types that is linked by the Internet Protocol (IP).

## Internet Service Provider's (ISP's) point-of-presence

The ISP's point-of-presence is where the customer calls or connects to reach the ISP's equipment.

## Internetwork

An internetwork is a collection of at least two interconnected networks.

## Interrupts

Devices use hardware or software interrupts to perform tasks. The interrupt is the method by which the device (such as a LAN adapter) or software program gets the attention of the CPU when it has work that needs to be done.

## IP

The Internet Protocol (IP) is a network transport protocol used by a variety of network operating systems, including NetWare. IP is commonly associated with the Internet, a collection of diverse computers that communicate with each other via IP.

## IP addresses

The IP address is the address assigned to a workstation or server that needs to communicate with another device via the Internet Protocol (IP).

## IPCONFIG

IPCONFIG is a Novell-supplied utility to enable functions of TCP/IP, such as static routing.

## IPX

The Internetwork Packet Exchange (IPX) protocol is the default protocol used by NetWare networks.

## IPXODI

IPXODI is the name of the executable file that loads the IPX protocol in Open Data-Link Interface (ODI) driver implementations.

## LARCHIVE

LARCHIVE is a workstation utility supplied with NetWare v2.xthat allows for workstation-based backup of binderies and data files.

## Large Internet Packet (LIP)

The Large Internet Packet (LIP) protocol provides the ability to send a packet in excess of 576 bytes over a router or server with multiple network adapters.

## Leaf

A leaf is an object in NDS that cannot contain other objects.

## LOAD PSERVER

This file server console command loads a NetWare Loadable Module (NLM) that controls printing on the network. PSERVER can be placed in the server's AUTOEXEC.NCF file if desired. PSERVER performs the collective functions of these programs: PSERVER.NLM, PSC, PCONSOLE, NPRINTER, RPRINTER, and PSERVER.EXE.

# Local Area Transport

Local Area Transport (LAT) is a digital protocol used for communication between workstations, terminal servers, and hosts.

## Login ID

LOGIN is a program executed at the workstation to identify the user to the server. Each user has a unique login ID that often consists of his or her name.When the user logs into the network, he or she enters the login ID.

## Login process

The login process refers to the process of executing the LOGIN program to authenticate the user to the file server or network.

## Login scripts

The login script contains a sequence of commands to establish the desired environment for the user on the network.

## LOGOUT

LOGOUT is a program that will terminate the logical session between a workstation and the server.

## LPT1

LPT1 is another name for the first parallel port on a workstation or server.

## LSL

The Link Support Layer (LSL) resides between the network adapter and the protocol stacks (such as IPX, IP, or the AppleTalk Filing Protocol) loaded on a workstation. It contains tables that coordinate the transfer of packets between the adapter and the protocol stack.

## Macintosh name space

When Macintosh workstations are added to the NetWare network, a NetWare Loadable Module called the Macintosh name space is loaded at the file server console to accommodate the naming conventions of the Macintosh file system.

## Mailing list

A mailing list is a method of subscribing to a discussion group on the Internet without having access to USENET (a collection of discussion groups on the Internet).

## ManageWise

ManageWise is a network management platform from Novell and Intel.

## Mandatory object

A mandatory object is a required object.

## Messaging Application Program Interface (MAPI)

The Messaging Application Program Interface (MAPI) is specified by Microsoft for messaging and mail services using Microsoft Mail.

## Mirroring

Mirroring is a process in which a physical drive is a carbon copy of another, preventing the server from going down due to drive failure. In a mirrored system, both drives share the same hard disk controller. Disks with different disk controllers are called duplexed drives.

## Mission-critical

A mission-critical process or series of processes is one that is so important to a business that everything would stop if it wasn't available.

## Modem

A modem is a device that allows digital data to be converted to tones that can be carried by conventional analog phone lines.

## Modem pool

A modem pool is a group of modems available to users on the network, without having a modem connected to each individual workstation.

## Multiprocessor

Multiprocessing is the ability to have more than one processor working on a task or the ability to support more than one processor.

## NBACKUP

NBACKUP is a Novell-supplied utility that backs up and restores data on file servers and local drives.

## NEARSERV

NEARSRV is a process that runs on a Personal NetWare server and answers to the request issued by a diskless workstation looking for its boot image.

## NET ADMIN

The NET ADMIN utlity allows you to access the configuration component of Personal NetWare.

## NET.CFG

The NET.CFG file is located on a workstation and contains the workstation's network configuration.

## NETADMIN

The NET ADMIN utilityallows you to access the configuration component of Personal NetWare.

# NETUSER

NETUSER is a NetWare 4.x utility that replaces parts of NetWare v3.x's SESSION, FILER, and SYSCON utilities.

## NetWare Connect

NetWare Connect is a Novell product that makes a pool of modems available for both inbound and outbound traffic.

## NetWare Core Protocol (NCP)

The NetWare Core Protocol (NCP) is used to encode requests going to the server and replies from the server returning to the workstation.

## NetWare Directory Services

NetWare Directory Services (NDS) consists of a database in NetWare 4.x that contains information about the resources on the network, including users, printers, and network drives. NDS allows a user to log into the network and make use of services on other joined networks without knowing their location.

## NetWare for SAA

NetWare for SAA is a method of connecting NetWare networks to host systems such as AS/400s or IBM 3090 mainframes.

## NetWare Loadable Module (NLM)

A NetWare Loadable Module is a program that can be loaded on a NetWare v3.x or 4.x server to enhance or provide an additional service. When the NLM is loaded at the file server console it become a integral, dynamic part of the network operating system. NLMs can consist of applications, LAN drivers, disk drivers, or name space modules.

## NetWare Runtime

NetWare Runtime consists of a 1- or 2-user license of NetWare v3.1x or 4.10 that runs services such as NetWare Connect or NetWare for SAA that doesn't require users to log into the server to use the service in question.

## NetWare shell

The NetWare shell (called NETX) is a terminate-and-stay-resident (TSR) program that intercepts commands at the workstation and decides whether they can be handled locally or need to be forwarded to the server.

## NetWare v3.11

NetWare v3.11 is a major release of NetWare. It was replaced by NetWare v3.12 and 4.x, which are currently sold.

## NetWire

NetWire is a collection of online forums on CompuServe that Novell maintains for its users. Forums include NetWare v2.x, v3.x, and 4.x, as well as GroupWise, NetWare for SAA, etc.

## Network adapter

A network adapter is a plug-in device that allows a workstation to connect to and communicate with the network.

## Network address

The network address is the address bound to the network transport protocol (e.g., IPX) on the server.

## Network-aware

Network-aware refers to a program that understands the presence of a network and can make use of it.

## Network management

Network management is the ability to manage intelligent or active devices on the network.

## Network Management Agent

A Network Management Agent consist of software that reports a predetermined set of information to a centralized management console.

## NETX shell

The NETX shell is used on a workstation to access a NetWare v2.x or v3.x server. It can be used on a NetWare 4.x server in bindery services mode.

## Newsgroup

A newsgroup is similar to a forum on CompuServe; it requires a USENET feed.

## News reader

A news reader is an application used to read newsgroups on USENET.

## Node address

The node address is the burned-in or locally administered address found on the network adapter.

## NLMIGRAT

NLMIGRAT is a migration utility used to move from NetWare Lite to Personal NetWare.

## NPRINT

NPRINT is a command line utility that allows printing to a NetWare queue without using the CAPTURE command.

# NPRINTER.EXE

NPRINTER.EXE is a workstation command line utility that allows users to configure printers and load or unload print drivers.

## OBJECT ID

The object ID is a hexadecimal number assigned to an object in NetWare Directory Services (NDS).

## Open Data-Link Interface (ODI)

The Open Data-Link Interface is a specification developed by Novell and Apple Computer to provide a uniform communication interface between network adapters and protocol stacks. Microsoft and 3Com's Network Driver Interface Specification (NDIS) is a competing specification.

## Open Shortest Path First (OSPF)

Open Shortest Path First (OSPF) is a link-state routing protocol for IP internetworks.

## Organizational unit

In NetWare Directory Services, an organizational unit divides an organization (company, division, etc.) so it can be more clearly identified. Organizational units are container objects and are not required, unlike organizations.

## OSI Model

The Open Systems Interconnect Model (OSI) is a seven-layer reference module for communication among peer devices.

## Packets

A packet is a defined block of information containing the data and header information at the upper layers of the OSI Model. Packets are divided into frames at the Physical Layer for delivery over the network media.

## Packet burst

Packet burst is a method that allows multiple packets to be sent to the server or client without waiting for an acknowledgment on an individual packet before sending the next one.

## Parallel processing

Parallel processing is the ability to have more than one processor working on a given task.

## PBURST.NLM

PBURST.NLM enables packet burst on a NetWare v3.11 server.

## PCONSOLE

PCONSOLE is a NetWare menu utility that allows you to create print servers and print queues. It requires Supervisor or equivalent rights.

## Peer

A peer is a device on the network that is considered equal to another device with respect to its participation in the communications process.

## Physical Layer

The Physical Layer is the lowest layer in the OSI Model, responsible for signaling and properties of the media.

## PPP

The Point-to-Point Protocol is used in dial-up Internet connections.

## PREFERRED SERVER

The PREFERRED SERVER statement found in the NET.CFG file causes the workstation to attach the user to the desired server.

## Protocol stack

A protocol stack is a terminate-and-stay-resident program loaded at the workstation or on the server, which implements the desired protocol.

## PSERVER

PSERVER is a NetWare Loadable Module that takes print jobs in the print queue and directs them to network printers.

# PRINTCON

PRINTCON is a utility that allows you to set printing parameters for print jobs such as No Form Feeds or No Tabs. It allows you to specify form name, print queue, device, and mode for print jobs

## Print queue

NetWare stores user's requested print jobs in print queues.

## RAID

Redundant Array of Inexpensive Disks. The RAID technology allows fault-tolerance in a disk storage subsystem. It consists of seven levels that define how data is striped or mirrored to disks. Disk mirroring is typically referred to as Raid Level 1.

## RCONSOLE

RCONSOLE is a NetWare utility that lets a NetWare manager or console operator to remotely access the file server console from a network workstation on the LAN.

## Read-only

A file flagged with the Read-only attribute can only be read, not written to or changed.

## Read/Write

Files flagged with the Read/Write attribute can be read from or written to.

## Remote Node Service

Remote Node Service (RNS) offers the functionality of a dial-in connection and appears on the network as if the workstation were directly attached to the network cable.

## Resources

Resources are components of the network, such as server hardware, network software, hubs and modems, and users.

## Reverse Address Resolution Protocol

RARP is a protocol that maps a hardware address to an Internet address.

## Rightsizing

Rightsizing is a variation of the term downsizing.

## RISC

Reduced Instruction Set Computing.

## Routers

Routers allow for the interconnection of LANs regardless of the topology being used.

# RPL

RPL stands for Remote Program Load, used in diskless workstations.

## RPRINTER

RPRINTER lets you define printers that are remote to the file server. It is loaded on the workstation attached to the printer.

## SALVAGE

SALVAGE is a Novell-supplied utility that allows deleted files residing on the server to be recovered.

## SCSI

Small Computer System Interface.

## Serial port redirection

Serial port redirection allows for workstation-based applications to take advantage of a modem pool attached to a NetWare Connect-enabled server.

## SERVER.EXE

The SERVER.EXE file is used to load NetWare on the server.

## Shared code violations

Shared code violations occur when an application finds a different revision of shared code than what it was expecting.

## Simple Mail Transfer Protocol (SMTP)

The Simple Mail Transfer Protocol (SMTP) is used for sending e-mail messages over the Internet.

## Simple Network Management Protocol

SNMP is a specification that designates the manner in which devices are managed on a network or networks. In SNMP, each device contains an SNMP agent, which an SNMP browser polls to determine its activities. The activities, statistics, and tasks monitored are defined in a Management Information Base (MIB).

## Simple Message Format

The Simple Message Format (SMF) forms the foundation for the MHS messaging platform.

## SLIP

Serial Line Internet Protocol. SLIP consists of a series of programs that allow access to the internet. SLIP connections are most commonly maded over dial-up lines.

## STARTUP.NCF

The STARTUP.NCF file is located on the server and contains commands used for starting NetWare.

## Stealth

Stealth refers to a virus that hides itself from detection programs.

## Striping

In striping, data is written or striped across multiple drives at the array, bit, byte, or block level.

## Supervisor

Supervisor is the login account on a NetWare v2.x or v3.x server with all rights.

## SYS volume

The SYS volume is a required volume on a NetWare server. It contains network operating system programs.

## SYSTEM.INI

The Windows 3.1 SYSTEM.INI file contains information on the system's configuration.

## TCP/IP

Transmission Control Protocol/Internet Protocol.

## TCP/IP address

The TCP/IP address uniquely identifies a device on an IP network.

## tech-support@novell.com

This is an alternate method of obtaining technical support from Novell via the Internet.

## Terminal emulation

Terminal emulation allows a PC to act as a dumb terminal on a host device.

## Thresholds

Thresholds are user-definable levels that trip an alarm when exceeded.

## TCPCON

TCPCON is the Novell-supplied configuration NetWare Loadable Module (NLM) that optimizes and monitors TCP/IP on a NetWare server.

## Transactions Per Second (TPS)

TPS is a benchmark used to define the speed at which the network system will be operating.

## Trustee assignments

Trustee assignments are also referred to as rights. They specify the rights users have with files and in directories. For example, a user may have create, erase, and modify rights to a directory, but not supervisory rights.

## TTS

Transaction Tracking System. TTS is an option in NetWare that allows for integrity in database transactions in the event of a failure through a process of rolling back the transaction to before the failure occurred.

## Uninterruptible power supply

An uninterruptible power supply (UPS) is a device that protects the file server in the event of fluctuations or disturbances in power. It contains batteries that provide steady power until the file server can be powered down correctly.

## User login script

The user login script executes after the system login script. It contains commands that affect the workstation's environment.

# UPS.NLM

The UPS.NLM is a NetWare Loadable Module (NLM) that loads on a Novell server to watch the attached uninterruptible power supply (UPS).

## Veronica

Veronica is an Internet service that makes searches via Gopher (a program that allows users to find files and resources on the Internet) easier to perform.

## Virus detection

Virus detection programs detect the presence of a virus. Viruses consist of software programs that are intentionally written to cause harm to a computer system.

## VLM.EXE

VLM.EXE is the DOS redirecter that enables a workstation to talk to a NetWare server.

## Volume

In NetWare, the file server's hard disks are divided into volumes during installation. A volume consists of a specified amount of hard disk space. NetWare automatically creates the SYS volume at installation time. Volumes contain directories and files. They can also span more than one disk.

## VREPAIR.NLM

VREPAIR.NLM corrects problems in the FAT or DET on NetWare volumes. It is a file server console utility that is loaded with the LOAD [path] VREPAIR statement.

## WINCIM

WINCIM is a graphical interface to CompuServe.

## Wide Area Network (WAN)

A wide area network is a series of networks connected by telecommunication links that cross a series of cities, states, or countries.

## WWW

WWW stands for the World Wide Web. The World Wide Web consists of numerous servers in different locations, called Web servers, that provide services to users of the Internet.

## NetWare v2.x



CD HELPdesk Series: Novell Products

Click on any icon for more information

Q+A | PROCEDURE LIST | REQUIRED

NETWORK UTILITIES | VENDOR LIST

## NetWare v2.x Q & A

[Error Message with v2.x Disk Drives](#)

[Error Message on Extended Memory and HIMEM.SYS](#)

[ETHERNET_II Frames](#)

[Hard Drives with Multiple Volumes](#)

[PSERVER.VAP and Core Printing](#)

[PSERVER.VAP and Network Connections](#)

[RAM Allowances](#)

## NetWare v2.x Q & A: RAM Allowances

**Due to the amount of hard drive space I have in the server, I have installed 20 megabytes (MB) of RAM. When the server starts up, it only acknowledges 12MB of RAM. Why doesn't it see all the memory?**

NetWare v2.2 can see a maximum of 12MB of RAM in dedicated mode and 8MB of RAM when configured for non-dedicated operation.

# NetWare v2.x Q & A: Error Message with v2.x Disk Drives



**After replacing the hard drive in my server with an IDE hard drive, I receive the console message "Invalid ROM Parameter table." I thought IDE drives were supposed to work with NetWare v2.x. What is happening?**



IDE drives work with NetWare v2.x but require a few changes. IDE drives were not supported when Novell released v2.15 and v2.2. The message you see is caused by selecting a user-definable drive type in CMOS. Since NetWare runs in protected mode and most BIOS RAMs don't run in this mode, you'll see this error. The real culprit is the user-defined drive type information, it is not usually stored in an area NetWare can read. If your CMOS setup has an option for DOS that allows you to specify where drive information is stored, choose this option. It is more likely that you will need to download IDE826.EXE or ISAREM.EXE from NetWire and follow the instructions included with these files to get your IDE drives to work. It is also possible that you may not need these drivers if you have a standard drive type in CMOS that is an exact match geometrically (it has the right combination of heads, cylinders, and sectors per track). When you "regen" your server to accept an IDE drive or when you make any changes, do not use anything above DOS 3.3. DOS 5.0 may work, but there are several reports of DOS 6.x causing servers not to start up because the environment present to the NetWare linker is significantly different in DOS 6.x than in other versions.

## NetWare v2.x Q & A: Error Message on Extended Memory and HIMEM.SYS

**An error message that no extended memory is available appears at the server console when it tries to run NET$OS.EXE. I don't understand this, as I have 8 megabytes (MB) of RAM in the server. What should I look for?**

It sounds as if you are running NetWare in non-dedicated mode. NetWare performs its own memory management that allows it to use everything above the first megabyte of memory. Because of this, NetWare cannot coexist with memory management software, such as HIMEM.SYS or EMM386.EXE. To release the greatest amount of conventional memory available, "gen" the server using DOS 3.3. This version of DOS has the lowest impact on conventional memory.

## NetWare v2.x Q & A: ETHERNET_II Frames

**Our company uses the ETHERNET_II frame type on every network server. We still have a few NetWare v2.x servers installed. I have been unable to find a way to get these servers to use the ETHERNET_II frame type. What am I missing?**

NetWare v2.x doesn't give you the option of using a frame type other than ETHERNET_802.3. To change the server to ETHERNET_II (which is the only other frame type NetWare v2.x supports), you will need to get a copy of NET$OS.EXE and run the ECONFIG utility against it (this utility is supplied on the server with NetWare v2.x). After making the change, you will need to FLAG NET$OS.EXE on the server so you can rename it before you copy the ECONFIGed NET$OS.EXE onto the server. Flag NET$OS.EXE to read-only (RO) after you've made the change. You will also need to have LAN drivers for the adapters in the server that support the ETHERNET_II frame type.

# NetWare v2.x Q & A: Hard Drives with Multiple Volumes

**When I installed a 1 gigabyte (GB) hard drive in the server, NetWare forced me to create multiple 255 megabyte (MB) volumes. Why?**

When Novell created NetWare v2.x, a 255MB hard drive was a very large hard drive. Larger hard drives could not be addressed as single volumes without significant changes to NetWare v2.x. A third-party solution from Ontrack Data Recovery called Disk Manager-N modifies NetWare and allows a drive to be seen as a single contiguous drive. This option requires regenning the operating system and changes several NetWare utilities. An easier option would be to upgrade the server to NetWare v3.12.

# NetWare v2.x Q & A: PSERVER.VAP and Core Printing

**I am currently using core printing on my NetWare v2.2 server. We need to install a remote printer that will be serviced by the file server. Can I run PSERVER.VAP on the file server even though core printing is already in place?**

Yes. It should work, but will provide for a confusing situation when troubleshooting a printing problem. The best solution is to perform a maintenance installation on the server, remove core printing services, and use PSERVER.VAP completely. Keep in mind that using PSERVER.VAP will use one connection on the server.

# NetWare v2.x Q & A: PSERVER.VAP and Network Connections

**We recently started using PSERVER.VAP to handle network printing. The server has a five-user license count, but since adding PSERVER.VAP, only four users can log in at one time. What's the problem and how do I fix it?**

In NetWare v2.x, PSERVER.VAP requires a user connection to be able to service print queues and send jobs to printers. Unfortunately, any print server solution will have this same impact on your NetWare v2.x network. Your only option is to revert back to core printing services and its limitations or upgrade to NetWare v3.12, which is more flexible.

# NetWare v2.x Procedure List

[Changing Server from Core Printing to PSERVER.VAP](#)

[Setting the Load Order of VAPs](#)

## NetWare v2.x Procedure: Changing Server from Core Printing to PSERVER.VAP

1. Boot the server from a DOS diskette.

2. Insert the System-1 diskette in the diskette drive, type INSTALL and press the Enter key.

3. Select Maintain Existing System and press the Enter key.

4. Press the Enter key.

5. Using the Down Arrow key, move to the Include Core Printing services? line.

6. Press N for No.

7. Press the Enter key.

8. Press F10 to save information and continue with the server regeneration process.

9. After the process is complete, reboot the server.

10. Log in as Supervisor or equivalent.

11. Copy PSERVER.VAP from the Print-1 diskette to SYS:SYSTEM directory.

12. Using PCONSOLE, configure the server for Print Services.

13. Down the server and reboot for the PSERVER.VAP to load.

## NetWare v2.x Procedure: Setting the Load Order of VAPs

1. Verify that all VAPs you need to load are in the SYS:SYSTEM directory.

2. Change the extension of the VAP you want to load first from .VAP to .VP0.

3. Repeat Step 2 but increase the number by one each time.

4. Down the server and restart for the change in load order to take effect.

## NetWare v2.x Utilities

[AuditWare from Preferred Systems](#)

[DaVinci eMAIL by On Technology Corp. (Free 30-Day Trial)](#)

[Notework Electronic Mail by On Technology Corp. (Free 30-Day Trial)](#)

# NetWare v2.x Utility: AuditWare from Preferred Systems



Automated Reporting Tools for the Enterprise

AuditWare is a Windows-based reporting tool for Novell NetWare.   It is the first available tool that provides true multi-server support.   And since configurations are captured to a database, it alleviates network degradation caused by most other reporting tools.   A Windows-based custom report writer enable exception reporting, and AuditWare's extensible architecture allows external databases to be linked into any report.

Your AuditWare license expires on (January 15, 1996).   To purchase a copy of AuditWare software, or to renew this license, please contact your PSI representative at (203) 937-3000.

Thank you for your interest in software from Preferred Systems, Inc.!

To install AuditWare, copy the directory \PROGRAMS\PSI\AUDIT to your hard disk, and choose the File Run option in Windows. Type in SETUP.

## NetWare v2.x Utility: Notework Electronic Mail by On Technology (Free 30-Day Trial)

Notework Electronic Mail includes support for Macintosh, Windows NT, DOS, and Windows 3.1 clients.

To install this software, copy the directory D:\PROGRAMS\NOTEWORK to your hard disk. Then run the INSTALL.BAT file from the Windows Program Manager File Run command line. If your hard drive is designated as drive C, type C:\ NOTEWORK\INSTALL.BAT and choose OK.

## NetWare v2.x Utility: DaVinci eMAIL by On Technology (Free 30-Day Trial)

DaVinci eMAIL includes NetWare Directory Services (NDS) support as well as NetWare MHS-based electronic mail capability for DOS, Windows and Macintosh environments.

To install DaVinci eMAIL, copy the subdirectory D:\PROGRAMS\DAVINCI to your hard disk. From the hard disk, follow these installation instructions:

1. Log in as "ADMIN" on a 386 or higher PC-compatible workstation with at least 2 megabytes (MB) of RAM and DOS 3.3 or higher.

If you do not have an ADMIN user name with supervisory rights on the network, you can use any user name that has supervisor equivalence.

2. Run Windows.

3. Select RUN from the File menu.

4. Click on the Browse button to select the drive that contains the subdirectory containing the files you copied from the CD-ROM, then select SETUP.EXE and click on OK.

   Example: C:\DAVINCI\SETUPWIN.EXE

5. Click on the OK button.

6. Read the introduction at the bottom of the Setup screen, then click on the Install DaVinci eMAIL button.

7. Click on the Browse button if you wish to change the eMAIL installation.

Specify a different location for the new eMAIL installation, including the name of the directory for eMAIL itself.

   Example: M:\PUBLIC\DAVINCI

Note: Make sure the path you specify is accessible to all your users; all users should have a drive mapped to that SERVER/VOLUME. Use a drive letter and a complete path syntax for the installation, not server/volume syntax. The Browse feature will help you avoid typos and incorrect syntax.

8. Click on the OK button.

The SETUP program will display the Disk Space Required to install the eMAIL program and its files.

9. Click on the Install button to continue.

Follow the instructions on the screen while the SETUP program installs eMAIL.

After SETUP finishes, you will be returned to the Windows Program Manager for a few seconds as SETUP closes and ADMIN loads.

## NetWare v2.x Requirements

- 286 or better CPU

- 20MB of disk space

- LAN adapter

- 2.5MB of RAM

# NetWare v3.x



**CD HELPdesk Series: Novell Products**

Click on any icon for more information

# NetWare v3.x Q & A

[Troubleshooting Login Failures](#)

[Upgrades and User Adjustment](#)

[User Differences Between NetWare v3.x and 4.1](#)

[VREPAIR Failure](#)

# NetWare v3.x Q & A: BINDFIX Before Replacing a Disk Drive

**I getting ready to replace the existing disk drive in a NetWare v3.11 server. The backup software we use has the ability to back the bindery up. Should I use the BINDFIX command to save the binderies prior to changing drives?**

It never hurts to have a backup copy of the binderies just in case. Since your tape backup software backs up the binderies, having an alternate copy isn't crucial. When using BINDFIX to get a "good" copy of the binderies, run it twice before copying the .OLD files to another location. The first time you run it, all you have is a backup of the binderies before any repair attempts were made. The second time you will have a verified good copy of the binderies. It is a good idea to run a BINDFIX on the server anytime you have an ABEND or make significant changes to the server to groups, individuals, and applications being installed or removed.

# NetWare v3.x Q & A: Error Message Incomplete Packets

**I periodically see a message on the server console that mentions IPX receiving an incomplete packet. What does this message mean?**

The message indicates that some part of the communications process on the LAN is having a problem. Download the latest iteration of LANDR4.EXE and apply MSM31X.NLM and the appropriate Topology Support Module (TSM). (Ethernet users would use ETHERTSM.NLM). If your network adapter is not supported by LANDR4.EXE, contact the manufacturers' technical support department for the adapter you have to get the latest LAN driver. If the message persists, try putting a different, preferably new, adapter in the server. Make sure that the workstations have the latest Open Data-Link Interface (ODI) drivers in place. The message could also be caused by a particular workstation.

## NetWare v3.x Q & A: User Differences Between NetWare v3.x and 4.1

**I am thinking about upgrading our network from NetWare v3.x to 4.1. What differences will the users see?**

If the users still are using NETX, they shouldn't see any difference. When you update them to Virtual Loadable Modules (VLMs), they may notice a small difference, but one that shouldn't present a problem. Updating to VLM.EXE prior to changing the server to NetWare 4.1 is also an option. The key ease of use factor will be how well the container login script is set up for users. If you have some users that are having a problem with the change in syntax that comes with the NetWare 4.1 command line utilities, you may want to think about using batch files that "help" the users complete the migration.

# NetWare 3.x Q & A: Erratic IRQ 15 Behavior

**Why does my network adapter act erratically when it is set to IRQ 15?**

NetWare v3.x uses IRQ 15 as a general internal cleanup IRQ. Depending on the modules loaded on the server, this may conflict with your network adapter or other device. As a general rule, use another IRQ for your network adapter. This effect may not be noticeable on systems running some NetWare Loadable Modules (NLMs).

# NetWare v3.x Q & A: RCONSOLE Doesn't Work

**Why can't I use RCONSOLE.EXE to remotely access my NetWare v3.12 server console?**

Most likely REMOTE.NLM and RSPX.NLM are not loaded on your server. If this is not the case, check the RCONSOLE version. If RCONSOLE is a 2.xx version, you may experience problems. The latest version is 3.75 and is available on NetWire as RCONSOLE.EXE. Remember to replace the copy in SYS:PUBLIC and in SYS:SYSTEM. You may also try loading RSPX with signatures turned off (e.g., LOAD RSPX SIGNATURES OFF).

## NetWare v3.x Q & A: Removing Access to NetWare Runtime Servers

**How can I keep users from attaching to the NetWare Runtime servers on the network and only attach to certain file servers when they first load VLM.EXE?**

A good way is to add the PS= statement to the batch file for loading the client. If you are using VLMs, add the parameter PS=X in the STARTNET.BAT file, in which X is the server they would normally log in to. You may find it easier to enter the command SET REPLY TO GET NEAREST SERVER=OFF at the server console prompt. You can check to see if this is already happening by using the SET command at the console, hitting the Enter key, selecting 1 for communications, and paging through the displays. You can also permanently set this command in the STARTUP.NCF or AUTOEXEC.NCF file.

## NetWare v3.x Q & A: Disabling LOGIN

**How can I keep users from logging into a server that I am working on while I am working on it?**

Use the DISABLE LOGIN command at the file server console. Remember to use ENABLE LOGIN after you are done so that they may log in again.

## NetWare v3.x Q & A: Troubleshooting Login Failures

**I can't login into my server. Is there any way I can tell if the server is seeing the request?**

You can see the Get Nearest Server request on the router tracking screen on he server. To invoke the router tracking screen, type TRACK ON and press the Enter key. When the client software (VLM.EXE or NETX.EXE) is loaded on the workstation, it sends a Get Nearest Server request among other things. You should also see the server answer with "Give nearest server". You should also see route requests. To close the router tracking screen, return to the console screen and type TRACK OFF. More information on the tracking screen can be found in the *System Administration Manual*.

## NetWare v3.x Q & A: Sharing CD-ROMs among Servers

**I am trying to install a second NetWare v3.12 server without using the multiple diskettes it requires. I have a CD-ROM drive on an Adaptec SCSI controller in the primary server. Is there any way I can install NetWare from the CD-ROM in the other server onto this server?**

You should be able to do it if you follow these Steps. Boot the second server as a workstation with the appropriate workstation drivers (i.e. LSL.COM and IPXODI.COM). Start the NetWare installation from the first diskette (from the new copy of NetWare you have) but use the network drive letter that is mapped to the CD-ROM drive in the first server when you are asked for the installation path. Don't load a network adapter driver at the second server until after all the files have been installed. If you do load a network adapter driver, you will lose the connection path to the first server.

# NetWare v3.x Q & A: Mirroring and Remirroring

**I am about to demirror the hard disks on my NetWare v3.12 server. Is there a way to demirror the drives without losing the data? If so, what is the process?**

Before starting this process, be sure to get at least one good backup that was made with a compare pass. If your server is not already on an uninterruptible power supply(UPS), put it on one for at least the time during which you are changing the server's volume configuration. Major problems could result from the server going down while the configuration is being changed.

At the server console, load INSTALL.NLM. Select Disk Options and Disk Mirroring. Be careful to note the disk numbers assigned by NetWare. In a two-drive system, for example, you should have numbers such as 5D000 and 5D010. 5D010 will be the second drive. After selecting the mirrored pair of hard drives under the Disk Mirroring option, highlight the second drive and press the Delete key. You will be asked to confirm that you want to delete this disk from the mirrored pair. Select Yes and press the Enter key. The remaining step you will need to perform is to create a volume on that drive. Although not required, it would be a good idea to put a MOUNT ALL statement in the server's AUTOEXEC.NCF file to ensure that all volumes mount when the server starts.

# NetWare v3.x Q & A: Capturing the Console Display

**Are there any NetWare Loadable Modules (NLMs) that can be loaded by the AUTOEXEC.NCF file that will CAPTURE the console screen to a file?**

NetWare v3.12 and 4.x ship with a NLM called CONLOG.NLM. You can add this NLM to NetWare v3.11 by downloading it from NOVLIB. This NLM is loaded in the AUTOEXEC.NCF file after setting the internal IPX network number. You can also enter an UNLOAD CONLOG command at the end of the AUTOEXEC.NCF file. This step is necessary so that the file created by CONLOG is closed, which allows it to be read by EDIT.NLM or by a DOS text editor. The file created by CONLOG.NLM is called CONSOLE.LOG and is placed in the SYS:\ETC directory. Each time the server is brought up and CONLOG is loaded, the CONSOLE.LOG file created the last time is overwritten with the events occurring from this execution of SERVER.EXE.

## NetWare v3.x Q & A: Low Directory Entries

**I have a NetWare v3.11 server. I am running low on directory entries for my volumes and would like to know how to increase the total number of directory entries for a volume. I thought you entered this number when the volume was created, but the manuals don't indicate how to increase this number.**

This is not a number you can set. In NetWare v3.11, the server raises it dynamically as needed. The available number of directory entries will become very low (somewhere around 2 percent of total) before the server raises it.

## NetWare v3.x Q & A: VREPAIR Failure

**Recently while backing up my NetWare v3.11 server, it abended. Volume SYS: wouldn't mount when I rebooted the server. Attempts to run VREPAIR.NLM have been unsuccessful. The server gets about halfway through repairing the directory entries on the volume and everything "freezes." Subsequent attempts to run VREPAIR yield the same results. I have the Macintosh name space loaded and have been able to remove it. How can I get past the problem?**

Download the patch 311PTD.EXE from NetWire and use the VREPAIR.NLM contained in this patch. Be sure to check the NOVLIB download area for an update to the MAC.NAM name space support module. The next thing to consider is updating the drivers for the hard disk controller you are using. You might have a flaky controller that needs to be replaced. Another option to try is Ontrack Data Recovery's Ontrack Data Recovery for NetWare (ODRN). This utility is an alternative to Novell's VREPAIR and will sometimes fix problems that VREPAIR.NLM can't.

## NetWare v3.x Q & A: Remote Server Rebooting

**I have to support servers that are not in the same location as I am. Is there a remote way to bring down a NetWare v3.x server and back it up without having to type in the commands at the server console?**

Create a file named REBOOT.NCF with a DOS text editor and place it in the SYS:SYSTEM directory. Place the following lines in this file:

    REMOVE DOS
    DOWN
    EXIT

By issuing the REMOVE DOS command, the EXIT command will reboot the server.

# NetWare v3.x Q & A: Server License Count Upgrades

**I am getting ready to upgrade our server from a 25-user to a 50-user license. How do I go about doing this? Are there any precautions I should take?**

Upgrading the user count on a NetWare v3.1x server is performed by downing the server, exiting to DOS, and copying the SERVER.EXE from the 50-user license SYSTEM_1 diskette onto the server's hard drive or boot diskette. As a precaution, you might want to rename the existing SERVER.EXE to something that reflects its license count in case you need to fall back to it. The name could be something like SERVER.25 for a 25-user license.

# NetWare v3.x Q & A: Register Memory Syntax

**We have an uncommon memory board in our NetWare v3.1x server. Memory was recently added to bring it up to 34 megabytes (MB) of memory. When SERVER.EXE runs, it only acknowledges 16MB of memory. I know we need to use the REGISTER MEMORY command, but I don't know what numbers to give it to correctly register the memory.**

Novell released the calculation last year on how to do this, but it can be somewhat confusing. An application called REGMEM.EXE on this CD-ROM under NetWare v3.x Utilities performs this calculation for you. REGMEM.EXE was written with Novell's AppWare product and requires Windows and approximately 1.1 MB on a hard disk to run.

# NetWare v3.x Q & A: Console Error Message Lost Interrupt

**I am receiving an error message on the server console that says "Secondary Interrupt Controller detected a lost hardware interrupt." What does this message mean and what do I do about it?**

This message indicates that a device in the server such as a LAN adapter or parallel port generated an interrupt service request (a process that notifies the CPU that there is a task to complete), but when the interrupt service routine in NetWare responded to process the request, the device originating the request could not be identified. This error is common with some inexpensive Integrated Drive Electronics (IDE) paddleboard-type disk controllers. It is possible that a device using IRQ15 could also be the problem. IRQ15 is a interrupt reserved for a garbage collection process that NetWare runs in v3.12 and 4.10.

If this message appears only periodically, you can disable it by entering the command SET DISPLAY LOST INTERRUPT ALERTS = OFF in the STARTUP.NCF file. It is best to place this statement at the top of the STARTUP.NCF file so that it takes effect when drivers and NetWare Loadable Modules (NLMs) load. If the message appears constantly, it is possible that you have a hardware device that is ready to fail.

# NetWare v3.x Q & A: Logging Out of Individual Servers

**I have users logged into multiple servers. Is there a way I can have them log out of one server but not all of them?**

Using the LOGOUT command, you can specify the server name you want to log out from: i.e. LOGOUT FS1. When you do this, you will see a message that you have logged out of server FS1. Your connections to the other servers will remain intact.

# NetWare v3.x Q & A: IDE CD-ROMs

**My server came with an Integrated Drive Electronics (IDE) CD-ROM drive installed. What drivers do I need to load to be able to mount the CD-ROM as a NetWare volume?**

NetWare v3.12 supports only SCSI CD-ROM drives. Novell has released a driver that will support an IDE CD-ROM drive for NetWare 4.10 LANs.

# NetWare v3.x Q & A: Running the PURGE Command

**How often should I run the PURGE command? No one can give me a good idea of when or how often to use it.**

There is no rule of thumb for running PURGE. It deletes all references in the File Allocation Table (*FAT)* and Directory Entry Tables (DET) for the file you purge. By running PURGE on a periodic basis, you free memory that is otherwise consumed by caching deleted files so they can be recovered using the SALVAGE utility. After PURGE runs, you can't recover files that were deleted before you ran the utility. By running PURGE with the /ALL option, you can start the purge process from the root of volume SYS: and work your way down the directory tree. IF you want to run PURGE against the entire volume, type PURGE \ /ALL to start the purge process from the root of the volume regardless of where you are in the directory tree. Depending on the amount of file access your server has, running PURGE on a quarterly basis may be sufficient.

## NetWare v3.x Q & A: CD-ROMs and Disk Space

**I have been using Novell's CDROM.NLM lately and have been noticing that less and less disk space is available. Am I starting to see the early signs of disk failure?**

You are seeing the signs of disk space being tied up by the files created by CDROM.NLM. These will help you find files on a CD-ROM platter without having to read the directory structure all the time. If space becomes an issue, you can use the command to reclaim some disk space. This command should be used sparingly, as it will delete all the CD-ROM index files found in CDROM$$.ROM in the SYS:SYSTEM directory. There isn't an option to delete specific CD-ROM index files unless you feel adventuresome and explore with FILER.

# NetWare v3.x Q & A: CD-ROM and ASPICD.DSK Drivers

**My server has multiple SCSI hard drive controllers. I recently started using the CD-ROM support built into NetWare v3.12. Intermittently, I have a problem in which CDROM.NLM doesn't see the CD-ROM drive attached to it. Sometimes I can fix this by unloading and reloading the drivers required for CD-ROM support. What can I do?**

Make sure you have enough memory in the server. Ideally, the cache buffer percentage should be 70 to 80 percent when all volumes are mounted. Verify that you have the latest drivers for the hard disk controllers you are using. The ASPICD.DSK driver is used in most installations and sometimes can cause problems. If the server has more than 16 megabytes of memory, you need to load ASPICD.DSK with the command ABOVE16=y from the command line. If the problem still exists, try using the CDNASPI.DSK driver. ASPICD.DSK occasionally has problems in servers with more than one ASPI-compliant SCSI hard drive controller. CDNASPI.DSK uses similar command line options, except that you will specify ABOVE16 on the command line.

# NetWare v3.x Q & A: Moving Data to a Larger Volume

**Is there any way that I can move data from an existing volume to a larger volume without reinstalling the network operating system and restoring the data from tape?**

You can try creating a volume on the new drive, copying the data from the SYS volume to the new volume, and renaming the volumes. Dismount the volumes before renaming them. The process should work, but check closely before making the network operational again. You may have a problem with trustee directory rights. Before starting a process like this, get at least one good backup of the server, two are. You should never consider a backup successful unless it compares to the device it has backed up.

# NetWare v3.x Q & A: Upgrades and User Adjustment



**I am thinking about upgrading our network from NetWare v3.x to NetWare 4.10. What differences will the users see?**



If the users still are using <span style="color:green">NETX</span>, they will see a difference with the <span style="color:green">NETUSER</span> and command line utilities. If you update them to Virtual Loadable Modules (VLMs), they may notice a small difference in the <span style="color:green">login process</span> that shouldn't present a problem. Updating to VLM.EXE prior to changing the server to NetWare 4.10 is also an option. The key factor to remember for ease of use will be how well you set up the container login script for the users. If users are having problems with the change in syntax that comes with the NetWare 4.x command line utilities, you may want to use batch files that help the users adjust to the upgrade.

# NetWare v3.x Q & A: Differences between v3.11 and v3.12

**What are the differences between NetWare v3.11 and v3.12?**

NetWare v3.12 was introduced with some key enhancements to v3.11. The following is a list of what's new in v3.12:

Latest and Greatest Drivers
1. Provides latest LAN drivers
2. Provides latest disk drivers
3. Provides about 30 patches since v3.11
4. Provides latest administrative utilities

Note: Items 1-4 can be downloaded from NetWire on CompuServe. However, with 30 patches that are provided in v3.12, that could be tedious and time-consuming.

NLMs
5. CD-ROM support and CD-ROM mounted as a NetWare volume
6. KEYB--allows different keyboards at the server console (i.e., French, English)
7. NLICLEAR--clears not logged in connection on NetWare
8. NUT--provides backward support for v3.11 NLMs that require the NUT library
9. NWSNUT--provides forward support for 4.x NLMs that require the NWSNUT library

Messaging
10. Provides two messaging products: Basic MHS NLM (e-mail engine) and FirstMail (e-mail application)

Performance Improvements
11. Packet Burst support
12.Large Internet Packets (LIP) support

Security Improvement
13. NCP Packet Signature support--higher security between workstation and server

Macintosh Licenses
14.Includes a free 5-user NetWare for Macintosh license

Online Documentation

15. Provides Electro-Text v3.12 manuals on a CD that can be used to scan for a particular book or chapter or keyword.

<u>Miscellaneous Others</u>
16. Support for the Virtual Loadable Module (VLM) client architecture
17. NMENU--uses less memory than MENU (who uses menu anyway?)
18. Provides special migration utilities for v2.x and v3.11 servers to v3.12 servers.
19. Supports 802.2 Ethernet frame type, whereas v3.11 supports 802.3.

You can purchase the following license numbers for v3.12:
5-, 10-, 25-, 50-, 100-, and 250-user support.

## NetWare v3.x Procedure List

[How to Change the Server Time in NetWare v3.x](#)

[Recovering a Deleted File on a 3.x Server](#)

[Setting Up Print Services for Server-Based Printers](#)

## NetWare v3.x Procedure: Recovering a Deleted File on a v3.x Server

1. Change to the directory where the deleted file resides.

2. Run SALVAGE.EXE.

3. Select the View/Recover Deleted File option and press the Enter key.

4. Press the Enter key when the Pattern to Match box appears on the screen.

5. Highlight the File Name to Recover and press the Enter key.

6. Answer Yes to Recover This File question.

## Setting Up Print Services for Server-Based Printers

1. Run the PCONSOLE utility from a workstation.

2. Select the Print Queue option and press the Enter key.

3. Press the Insert key, enter the print queue name, and press the Enter key.

4. Press Esc to return to the Available Options menu.

5. Select Print Server Information and press the Enter key.

6. Press the Insert key, enter the print server name, and press the Enter key.

7. Select a New Print Server name and press the Enter key.

8. Select the Print Server Configuration option and press the Enter key.

9. Select the Printer Configuration option and press the Enter key.

10. Select the first line labeled "Not installed" and press the Enter key.

11. Change the Name Field to reflect the printer name and location and press the Enter key.

12. The Type Field for a server-attached printer should be parallel, LPTx, or serial, COMx (in which x is the port number). Select the appropriate choice, then press the Enter key.

13. Press Esc, answer Yes to Save Changes to return to the Configured Printers display.

14. Press Esc to return to the Printer Configuration menu.

15. Select Queues Serviced by Printer and press the Enter key.

16. Select the Printer Configuration menu in Step 10 and press the Enter key.

17. Press Ins to display a list of available print queues.

18. Select the print queue you created in Step 3 and press the Enter key.

19. Press the Enter key when the Priority Box appears on the screen.

20. Press Alt-F10 to exit PCONSOLE.

21. At the file server console prompt, enter LOAD PSERVER followed by the print server name you entered in Step 6.

## How to Change the Server Time in NetWare v3.x

1. Log into the server as Supervisor or supervisor-equivalent.

2. Run the FCONSOLE utility.

3. Select the Status option and press the Enter key.

4. Use the Right Arrow key on the keyboard to highlight the Time Field.

5. Press the Enter key.

6. Change the time to the correct value and press the Enter key.

## NetWare v3.11 or v3.12 Requirements

**Server requirements:**

CPU: 386 or later machine (DX is preferred, but SX will work.)

Memory: 6 MB

Disk space: 15 MB (40 MB if online documentation installed)

CD-ROM: To be mountable as a NetWare volume, the CD-ROM drive must be a true SCSI device that will connect to an Adaptec or another ASPI-compatible SCSI hard drive controller. If the CD-ROM drive comes with its own controller, you will only be able to use the drive to install software to it and won't be able to use the drive to mount CD-ROMs as NetWare volumes.

**Client requirements:**

DOS: DOS 3.1 or later and the NetWare Client for DOS

Windows: Microsoft Windows 3.0 or later, DOS 3.1 or later, and the NetWare Client for DOS

OS/2: OS/2 1.1 or later (Standard or Extended Edition); OS/2 2.11 or OS/2 Warp will work, but require that the updated OS/2 Requester from NetWire.

Macintosh: Macintosh operating system 6.0 or later

## NetWare v3.x Utilities

AuditTrack v2.04 by On Technology (Free 30-Day Trial)

AuditWare from Preferred Systems

BrightWorks from McAfee

Close-Up/LAN Pro v6.1 from Norton-Lambert

Common Knowledge by On Technology (Free 30-Day Trial)

DaVinci eMAIL by On Technology (Free 30-Day Trial)

John T. McCann's SofTrack by On Technology (Free 30-Day Trial)

LAN Inventory from McAfee

LAN Support Center from McAfee

Meeting Maker XP Cross Platform Group Scheduler from On Technology (Free 30-Day Trial)

NetLauncher v1.0 FC3 from CompuServe

NetShield v2.2 from McAfee

NetTools from McAfee

NMENU335 by Dirk Engelhardt

Notework Electronic Mail by On Technology (Free 30-Day Trial)

RAMCAL3.ZIP

REGMEM.ZIP

SiteExpress from McAfee

SiteMeter from McAfee

Software Sentry by Microsystems Software

TAPCIS from the Support Group

[TCPRINT--Host TCP/IP Printer Server for NetWare](#)

[VirusScan for Windows 95 from McAfee](#)

[VirusScan from McAfee](#)

[WHOHASIT by Andrew Cobb](#)

[WINCIM 1.4 Novell Edition from CompuServe](#)

[NetWare v3.x Utility: WINMENU GE v2.4 for All Networks](#)

[WINMENU v6.04 for Novell v3.x Networks](#)

## NetWare v3.x Utility: AuditWare from Preferred Systems

Automated Reporting Tools for the Enterprise

AuditWare is a Windows-based reporting tool for Novell NetWare.   It is the first available tool that provides true multi-server support.   And since configurations are captured to a database, it alleviates network degradation caused by most other reporting tools.   A Windows-based custom report writer enable exception reporting, and AuditWare's extensible architecture allows external databases to be linked into any report.

Your AuditWare license expires on (January 15, 1996).   To purchase a copy of AuditWare software, or to renew this license, please contact your PSI representative at (203) 937-3000.

Thank you for your interest in software from Preferred Systems, Inc.!

To install AuditWare, copy the directory \PROGRAMS\PSI\AUDIT to your hard disk, and choose the File Run option in Windows. Type in SETUP.

## NetWare v3.x Utility: Software Sentry by Microsystems Software

Software Sentry from Microsystems Software Inc. is a license metering and software asset management package for any network, including NetWare.

To install Software Sentry, copy the subdirectory \PROGRAMS\MICROSYS to your hard disk. From the File Run command, type SETUP.

## NetWare v3.x Utility: WHOHASIT by Andrew Cobb



WHOHASIT displays the files a workstation is using on a NetWare network, including volume use. It also allows you to send broadcast messages.

To run it, copy the directory \PROGRAMS\WHOHASIT to your hard disk. WHOHASIT is a Windows utility. To install it, type WHOHASIT.EXE from the File Run option in Windows.

## NetWare v3.x Utility: NMENU335 by Dirk Engelhardt

NovMenu v3.35 is a menu system for NetWare.

To install it, copy the directory \PROGRAMS\NMENU335 to the SYS:SYSTEM directory on your file server.

## NetWare v3.x Utility: WINMENU GE v2.4 for All Networks

Requires Windows 3.1 or above.

Winmenu is a state-of-the-art menu program for Windows users designed to facilitate access to all applications and provide authorized access for the users. LAN sites that are contemplating to move to the   Windows environment will find Winmenu a must. Winmenu provides easy and intuitive access without the complications of the Program Manager. The greatest advantages of Winmenu are its ability to ease administration tasks and provide authorized access based on the group codes the user belongs to. It is cost-effective and looks great!

Please read the WINMENU.TXT file for more information.

To install it, copy the D:\PROGRAMS\WINMENUG directory to your hard disk.

Copyright by Ricky Freyre, 1995 / All rights reserved.
CompuServe # 70154,2635
Internet:   70154.2635@compuserve.com

# NetWare v3.x Utility: WINMENU v6.04 for Novell v3.x Networks

Requires Windows 3.1 or above running Novell v3.0 or above.   (Note: A version of Winmenu is available for any network.)

Tested with Windows For Workgroups, Windows NT, Windows 3.x and Windows 95. Works with clients using VLM or NETX.

Winmenu is a state-of-the-art menu program for Windows users designed to facilitate access to all applications and provide authorized access   for the users. Novell LAN sites that are contemplating to move to the   Windows environment will find Winmenu a must. Winmenu provides easy and intuitive access without the complications of the Program Manager.   The greatest advantages of Winmenu is its ability to ease the   administration tasks and provides authorized access based on the group codes the user belongs to. Winmenu looks great and is cost effective!.

Please read the WINMENU.TXT file for more information

To install it, copy the D:\PROGRAMS\WINMENUN directory to your hard disk.

Copyright by Ricky Freyre, 1993 - 1995 / All rights reserved.
Compuserve# 70154,2635
Internet:   70154.2635@compuserve.com

## NetWare v3.x Utility: TCPRINT--Host TCP/IP Printer Server for NetWare



TCPrint is a printer server that resides on a NetWare file server and complies with RFC1179 protocol for a Line Printer Daemon (LPD).

All hosts that support the TCP/IP LPD protocol can assign their print jobs into the NetWare server's print queues directly via TCPrint. There is no additional software required for those hosts.

Users can assign their jobs transparently just as if they are printing on the host. All processes will be done by host and TCPrint.

Also, TCPrint performs UNIX to DOS ASCII text translation automatically.

It also provides LPQ and LPRM commands. Some UNIX systems didn't interpret job status data more than two lines long when the LPQ command was issued. Please contact the author if this situation occurs. This version has been tested for NetWare v3.x and 4.x. It doesn't need too much expertise for installation.

To install it copy the D:\PROGRAMS\TCPRINT directory to your hard disk.

Please read the README.DOC file for more information.

## NetWare v3.x Utility: AuditTrack v2.04 by On Technology (Free 30-Day Trial)



AuditTrack v2.04, a NetWare auditing product, is a network surveillance system that allows LAN administrators to track and identify all login, file, remote access and bindery activity occurring anywhere on a NetWare network.

To install this software, copy the directory D:\PROGRAMS\AUDITTR to your hard disk. Then run the SETUP program from the Windows Program Manager File Run command line. If your hard drive is designated as drive C, type C:\AUDIT\ setup.exe and choose OK.

## NetWare v3.x Utility: BrightWorks v2.0 from McAfee

BrightWorks v2.0, an integrated enterprise network management suite for NetWare v3.x and 4.x networks, includes server monitoring, server performance tuning, help desk, and advanced scripting modules, as well as enterprise metering, inventory, and software distribution capabilities.

To install this software, copy the directory D:\PROGRAMS\MCAFEE\BWORKS to your hard disk. Then run the SETUP program from the Windows Program Manager File Run command line. If your hard drive is designated as drive C, type C:\BWORKS\Setup.exe and choose OK.

# NetWare v3.x Utility: Close-Up/LAN Pro v6.1 from Norton-Lambert



This is a timed evaluation that includes two fully running programs: the Close-Up modem remote communications package and the Close-Up/LAN Pro network remote communications package. Users can demo the Close-Up modem product, the Close-Up/LAN Pro network product, or both products simultaneously.

A README file is included that is a manual and quick reference guide for operating both Close-Up and Close-Up/LAN Pro modem and network programs.

**Requirements**:

- Hardware: IBM PCs, ATs, XTs, PS/2s, or 100 percent compatibles
    - Operating System: MS or PC DOS 3.3 or later
      Windows (Optional): Windows 3.1 or 3.11; Windows for Workgroups 3.11
- Mouse (optional): Microsoft mouse or 100 percent compatibles
- Network (optional): NetWare or any popular network
- Modems: Point and Select from over 800 modems
- Monitors: Monochrome through SVGA
  Memory: Close-Up Host OK (with UMBs) or 42 kilobytes (KB), remote 375KB
  Close-Up/LAN Pro Host OK (with UMBs) or 47KB, remote 375KB
- Hard disk: Recommended
- Note: Tow machines are required to establish a remote connection.


Installation:

To install, copy the directory D:\PROGRAMS\NORTON to your hard disk.
Type CINSTALL at the DOS prompt.

## NetWare v3.x Utility: Common Knowledge by On Technology (Free 30-Day Trial)

Common Knowledge, a collaborative groupware product for sharing information and documents, allows users to create, access, edit, distribute, and share information over a network while providing a structure for managing and tracking the input of workgroup participants.

To install this software, copy the directory D:\PROGRAMS\COMMON to your hard disk. Then run the SETUP program from the Windows Program Manager File Run command line. If your hard drive is designated as drive C, type C:\ common\setup.exe and choose OK.

# NetWare v3.x Utility: DaVinci eMAIL by On Technology (Free 30-Day Trial)

DaVinci eMAIL includes NetWare Directory Services (NDS) support as well as NetWare MHS-based electronic mail capability for DOS, Windows, and Macintosh environments.

To install DaVinci eMAIL, copy the subdirectory D:\PROGRAMS\DAVINCI to your hard disk. From the hard disk, follow these installation instructions:

1. Log in as "ADMIN" on a 386 or higher PC-compatible workstation with at least 2 megabytes (MB) of RAM and DOS 3.3 or higher.

If you do not have an ADMIN user name with supervisory rights on the network, you can use any user name that has supervisor equivalence.

2. Run Windows.

3. Select RUN from the File menu.

4. Click on the Browse button to select the drive that contain the subdirectory containing the files you copied from the CD-ROM, then select SETUP.EXE and click on OK.

   Example: C:\DAVINCI\SETUPWIN.EXE

5. Click on the OK button.

6. Read the introduction at the bottom of the Setup screen, then click on the Install DaVinci eMAIL button.

7. Click on the Browse button if you wish to change the eMAIL installation.

Specify a different location for the new eMAIL installation, including the name of the directory for eMAIL itself.

   Example: M:\PUBLIC\DAVINCI

Note: Make sure the path you specify is accessible to all your users; all users should have a drive mapped to that SERVER/VOLUME. Use a drive letter and a complete path syntax for the installation, not server/volume syntax. The Browse feature will help you avoid typos and incorrect syntax.

8. Click on the OK button.

The SETUP program will display the Disk Space Required to install the eMAIL program and its files.

9. Click on the Install button to continue.

Follow the instructions on the screen while the SETUP program installs eMAIL.

After SETUP finishes, you will be returned to the Windows Program Manager for a few seconds as SETUP closes and ADMIN loads.

## NetWare v3.x Utility: John T. McCann's SofTrack By On Technology (Free 30-day Trial)

SofTrack, a software metering package, includes native support for Novell's NetWare Directory Services (NDS).

To install this software, copy the directory D:\PROGRAMS\SOFTRACK to your hard disk. Then run the INSTALL program from the Windows Program Manager File Run command line. If your hard drive is designated as drive C, type C:\softrack\install.exe and choose OK.

## NetWare v3.x Utility: LAN Inventory from McAfee

BrightWorks LAN Inventory automates the collection, consolidation, analysis, and reporting of LAN asset information and provides support for Compaq's Intelligent Manageability strategy, as well as distributed PC assets.

To install this software, copy the directory D:\PROGRAMS\MCAFEE\LANINV and D:\PROGRAMS\MCAFEE\HELP to your hard disk. Then run the SETUP program from the Windows Program Manager File Run command line. If your hard drive is designated as drive C, type C:\LANINV\setup.exe and choose OK.

## NetWare v3.x Utility: LAN Support Center from McAfee



LAN Support Center, a help desk package, helps administrators automate the collection, tracking, and analysis of end-user support requests.

To install this software, copy the directory D:\PROGRAMS\MCAFEE\LANSUP and the subdirectories under it to your hard disk. Then run the SETUP program from the Windows Program Manager File Run command line. If your hard drive is designated as drive C, type C:\LSC \setup.exe and choose OK.

## NetWare v3.x Utility: Meeting Maker XP Cross Platform Group Scheduler by On Technology Corp. (Free 30-Day Trial)

Meeting Maker XP, group scheduling software, includes LAN and Internet support, as well as other e-mail integration features.

To install this software, copy the directory D:\PROGRAMS\MEETING to your hard disk. Then run the SETUP program from the Windows Program Manager File Run command line. If your hard drive is designated as drive C, type C:\MEETING\setup.exe and choose OK.

# NetWare v3.x Utility: NetLauncher v1.0 FC3 from CompuServe

NetLauncher v1.0 is Internet access software for CompuServe.

To install this software, copy the directory D:\PROGRAMS\NETLAUNC to your hard disk. Then run the SETUP program from the Windows Program Manager File Run command line. If your CD-ROM drive is designated as drive D, type d:\netlaunc\setup.exe and choose OK.

## NetWare v3.x Utility: NetShield from McAfee



NetShield 2.2 for NetWare is an anti-virus package for DOS, Windows, and OS/2. The new release includes Novell NetWare 4.1 support, enhanced notification options, a Windows console, administrator access controls, and increased scanning and detection performance.

To install this software, copy the directory D:\PROGRAMS\MCAFEE\NSH to your hard disk. Then run the SETUP program from the Windows Program Manager File Run command line. If your hard drive is designated as drive C, type C:\ MCAFEE\NSH\setup.exe and choose OK.

## NetWare v3.x Utility: NetTools from McAfee



NetTools, a Windows Desktop Management solution, includes global management capabilities and (NDS) support, as well as menu administration, print management, software distribution and, workstation security.

To install this software, copy the directory D:\PROGRAMS\MCAFEE\NTOOLS to your hard disk. Then run the SETUP program from the Windows Program Manager File Run command line. If your hard drive is designated as drive C, type C:\ntools\setup.exe and choose OK.

## NetWare v3.x Utility: Notework Electronic Mail by On Technology (Free 30-Day Trial)

Notework Electronic Mail includes support for Macintosh, Windows NT, DOS, and Windows 3.1 clients.

To install this software, copy the directory D:\PROGRAMS\NOTEWORK to your hard disk. Then run the INSTALL.BAT file from the Windows Program Manager File Run command line. If your hard drive is designated as drive C, type C:\ notework\install.bat and choose OK.

## NetWare v3.x Utility: SiteExpress from McAfee

SiteExpress is an Electronic Software Distribution package that contains enterprise software distribution capabilities, as well as management report generation

To install this software, copy the directory D:\PROGRAMS\MCAFEE\SITEXP to your hard disk. Then run the SETUP program from the Windows Program Manager File Run command line. If your hard drive is designated as drive C, type C:\sitexp\setup.exe and choose OK.

## NetWare v3.x Utility: SiteMeter from McAfee

SiteMeter is an enterprise-wide software metering tool that supports global reporting of application license compliance and usage, as well as consolidation of reporting of metering data from multiple servers and locations and anti-virus functions.

To install this software, copy the directory D:\PROGRAMS\MCAFEE\SITEMTER to your hard disk. Then run the SETUP program from the Windows Program Manager File Run command line. If your hard drive is designated as drive C, type C:\sitemtEr\setup.exe and choose OK.

## NetWare v3.x Utility: TAPCIS from the Support Group

TAPCIS is an access program for CompuServe that allows you to automate the work you would normally do manually such as reading messages and writing messages, sending and retrieving e-mail, and downloading and uploading files.

To install this software, copy the directory D:\PROGRAMS\TAPCIS to your hard disk. Then run the TAPTRY.EXE program from the Windows Program Manager File Run command line. If your hard drive is designated as drive C, type C:\ TAPCIS\TAPTRY.EXE and choose OK.

# NetWare v3.x Utility: VirusScan for Windows 95 from McAfee

VirusScan for Windows 95, a native 32-bit anti-virus solution, exploits the new capabilities of Windows 95.

To install this software, copy the directory D:\PROGRAMS\MCAFEE\S95 to your hard disk. Then run the SETUP program from the Windows Program Manager File Run command line. If your hard drive is designated as drive C, type C:\S95 \ 100E.exe and choose OK.

## NetWare v3.x Utility: VirusScan from McAfee



VirusScan is an anti-virus package from McAfee for NetWare LANs.

To install this software, copy the directory D:\PROGRAMS\MCAFEE\WSC to your hard disk. Then run the SETUP program from the Windows Program Manager File Run command line. If your hard drive is designated as drive C, type C:\WSC\setup.exe and choose OK.

# NetWare v3.x Utility: WINCIM 1.4 Novell Edition from CompuServe

WINCIM 1.4 is Windows-based access software for CompuServe.

To install this software, copy the directory D:\PROGRAMS\WINCIM to your hard disk. Then run the SETUP program from the Windows Program Manager File Run command line. If your hard disk is designated as drive C, type c:\wincim\setup.exe and choose OK.

# REGMEM.ZIP



This utility tells you how to use the REGISTER MEMORY command. To install it, copy it to your hard disk and unzip it. Then, from the File Run menu of Windows, enter the executable REGMEM. REGMEM takes 1.1 megabytes of disk space.

# RAMCAL3.ZIP

This utility tells you how to calculate RAM for a NetWare v3.x file server. To install it, copy it to your hard disk and unzip it. Then, from the File Run menu of Windows, enter the executable RAMCAL3. RAMCAL3 takes 1.1 megabytes of disk space.

# NetWare v3.x Demos

Ontrack Data Recovery Slideshow

## NetWare v3.x Demo: Ontrack Data Recovery Slideshow

The Ontrack Volume Repair Detector package is designed to inform NetWare supervisors and system administrators about safe methods for recovering from NetWare volume corruption. The package contains two sections, a Novell NLM that detects the loading of VREPAIR, and a slideshow presentation that educates users on data security. The NLM warns supervisors to make certain that backups are adequate before attempting any repairs that could permanently damage critical files. The slideshow provides screen shots from the Ontrack Data Recovery for NetWare data recovery and protection utility.

To view the slideshow, run D:\PROGRAMS\ONTRACK\SLIDESHW.EXE from the File Run option of the Windows Program Manager.

# NetWare v3.x CNA/CNE Q & A

What is the minimum amount of RAM you need for a NetWare v3.x file server?

    1. 6 megabytes
    2. 8 megabytes
    3. 12 megabytes
    4. 16 megabytes

How many megabytes of disk space must be available to install NetWare v3.x?

    1. 12 megabytes
    2. 16 megabytes
    3. 24 megabytes
    4. 50 megabytes

Which utilities are used to customize print jobs?

    1. Printcon, Pconsole
    2. Printdef, Pconsole
    3. Printdef, Printcon
    4. Printcon, Psc

Which utilities are used to redirect print jobs?

    1. Capture, Nprint
    2. Capture, Rprinter
    3. Rprinter, Psc
    4. Pconsole, Psc

Which modules must be loaded on the server to implement remote console management?

    1. Remote.NLM, SPXS.NLM
    2. SPXS.NLM, Control.NLM
    3. Remote.NLM, RS232.NLM
    4. Remote.NLM, RSPX.NLM



Which modules must be loaded on the server to implement asynchronous remote console management?

    1. Remote.NLM, SPXS.NLM
    2. SPXS.NLM, Control.NLM
    3. Remote.NLM, RS232.NLM
    4. Remote.NLM, RSPX.NLM



Which utility is used to add users to the server?

    1. Syscon
    2. NetAdmin
    3. NWAdmin
    4. NetUser



Which utility allows you to see what files a user has open?

    1. Syscon
    2. Fconsole
    3. Monitor
    4. FileMon

What is the default frame type for NetWare v3.12?

1. Ethernet_802.3
2. Ethernet_802.2
3. Ethernet_II
4. Ethernet_SNAP

How many network adapters does NetWare v3.12 support?

1. 2
2. 4
3. 6
4. Limited by available interrupts

What modules must loaded for a NE2000 network adapter to work in a server?

1. MSM.NLM, ETHERTSM.NLM, NE2000.LAN
2. MSM31X.NLM, ETHERTSM.NLM, NE2000.LAN
3. MSM.NLM, TOKENTSM.NLM, NE2000.LAN
4. MSM31X.NLM, TOKENTSM.NLM, NE2000.LAN

What is the default block size when creating a volume?

1. 8KB
2. 32KB
3. 4KB
4. 16KB

What is the default volume name for the first volume created?

    1. SYS
    2. PRIMARY
    3. VOL
    4. User-defined



What utility can change the date and time on the server?

    1. SYSCON
    2. FCONSOLE
    3. SESSION
    4. PCONSOLE



You are currently in SYS:PUBLIC. What is the correct syntax command for Purge to run over the entire volume?

    1. PURGE /ALL
    2. PURGE SYS /ALL
    3. PURGE \ /ALL
    4. PURGE \ /SUB



What utility allows users to map drive and capture printers?

    1. SESSION
    2. NETUSER
    3. SYSCON
    4. NWTOOLS



What statement in NET.CFG controls the first drive letter mapped to the server?

1. FIRST DRIVE
2. FIRST NETWORK DRIVE
3. NETWORK DRIVE
4. DRIVE

Which statement is required in NET.CFG for proper operation in Windows?

1. local printers = 2
2. show dots = ON
3. max tasks = 20
4. DOS name = msdos

Which console command allows you to see all servers on the internetwork?

1. track on
2. reset router
3. display servers
4. display networks

Which console command displays all SAP/RIP activity on the network?

1. track on
2. display networks
3. display routes
4. display servers

Which utility allows you to back up the server to a tape drive mounted on the Server?

1. SBACKUP

2. NBACKUP
3. BACKUP
4. NETBACK

Which directories are created on SYS during initial installation?

1. MAIL, PUBLIC, MASTER, USERS
2. MAIL, PUBLIC, SYSTEM, ETC
3. PUBLIC, PRINTER, SYSTEM, ETC
4. BACKUP, ETC, PUBLIC, SYSTEM

The correct answer is #1: 6 megabytes.

The correct answer is #4: 50 megabytes.

The correct answer is # 2: Printdef, Pconsole.

The correct answer is # 1: Capture, Nprint.

The correct answer is # 4: Remote.NLM, RSPX.NLM.

The correct answer is #3: Remote.NLM, RS232.NLM.

The correct answer is #1: Syscon.

The correct answer is #3: Monitor.

The correct answer is #2: Ethernet_802.2.

The correct answer is #4: limited by available interrupts.

The correct answer is #2: MSM31X.NLM, ETHERTSM.NLM, NE2000.LAN.

The correct answer is #3: 4k.

The correct answer is #1: SYS.

The correct answer is #2: FCONSOLE.

The correct answer is #3: PURGE \ /ALL.

The correct answer is #1: SESSION.

The correct answer is #2: FIRST NETWORK DRIVE.

The correct answer is #2: show dots = on.

The correct answer is #3: display servers.

The correct answer is #1: track on.

The correct answer is #1: SBACKUP.

The correct answer is #2: MAIL, PUBLIC, SYSTEM, ETC.

# NetWare 4.x

## NetWare 4.x Q & A

## NetWare 4.x Q & A: Flex/IP and NetWare 4.1

**I am getting ready to upgrade to NetWare 4.1 and want to move my copy of Flex/IP to the new server. What patches do I need to download to get Flex/IP to run under NetWare 4.1?**

Due to differences between the CLIB.NLM in NetWare 4.1 and the versions of NetWare 4.0x and v3.x, Flex/IP will not run under NetWare 4.1. Novell has released Unix Services 2.0 to address those who need the functionality of NetWare NFS, Flex/IP, and NFS Gateway.

## NetWare 4.x Q & A: LOGIN 4.12-970 Error Attempting to Attach

**I have installed NetWare 4.1 and receive this error message when I try to log in:**

**LOGIN-4.12-870: An unknown error was returned during LOGIN's attempt to attach. Error code: 8848.**

Error code 8848 indicates a function call was made to a non-existent overlay such as a Virtual Loadable Module (VLM). If this is your first installation of NetWare 4.x, it would be a good idea to log in using NETX instead of VLM.EXE and run the client installation from the SYS:PUBLIC\CLIENT\DOSWIN directory. Also check the NET.CFG file to make sure that the module NDS.VLM has not been commented

## NetWare 4.x Q & A: Remotely Downing a NetWare 4.x Server

**I have to support servers that are not always at the same location as I am. Is there a way to remotely bring a NetWare 4.x server down and back up without having to type in the commands at the keyboard on the server console?**

Yes. Create a file named REBOOT.NCF with a DOS text editor and place it in the SYS:SYSTEM directory for each server you want to DOWN remotely. Place these lines in this file:

    DOWN
    RESTART SERVER

These commands will down the server and perform the equivalent of a PC warm boot. The server will come back online much faster than exiting to DOS and executing the SERVER.EXE command. If you have hardware in the server that needs to go through a cold boot to initialize properly, your REBOOT.NCF file should look like this:

    REMOVE DOS
    DOWN
    EXIT

By issuing the REMOVE DOS command, the EXIT command will reboot the server.

# NetWare 4.x Q & A: Synthetic Time

**I notice a message periodically on the file server console that synthetic time is being issued. What does this mean?**

This is an advisory message indicating that a NetWare Directory Services (NDS) transaction has been received at the server which bears a time that is later than the time the server thinks it is. NetWare 4.1 adjusts its time to allow the transaction to be posted. Depending on the size of your network, you might want use SERVMAN.NLM to tell the other servers where to locate their time synchronization information instead of depending on the time sync Service Advertising Protocol (SAP) packet to do this for you. On busy networks, the delay in the time sync SAP packet arriving to all servers could cause this type of problem.

# NetWare 4.x Q & A: MAP NEXT Statement Doesn't Work

**I am trying to use the MAP NEST command in my NetWare 4.1 container login script but it isn't working. This command worked in NetWare 3.x. What am I doing wrong?**

The correct syntax is MAP N NW41_1_SYS: in which N is used instead of NEXT. The NetWare 4.1 MAP command also has the option of using the volume name (as in NetWare v3.x) or the NetWare Directory Services (NDS) name for the volume (which can be viewed in NetAdmin or NWAdmin).

# NetWare 4.x Q & A: Error Writing to Directory Message

**I periodically receive an "Error writing to directory" message on the server. The users all receive this message on their screens. We have to down the server and restart it. Everything appears to be fine after that until the next time we receive the message. Is this something we should be concerned about?**

Yes. This is usually the sign of an impending drive failure. Make sure that you have the latest driver for the hard disk controller in the server. Updating the driver can resolve the problem in some cases. Try the controller in a different slot. Check the hard drive statistics in MONITOR.NLM to see if the redirected block count is climbing. If it is, replace the hard drive as soon as possible. If money is tight, you might be able to buy some time by low-level formatting the current drive and restoring the backup tape.

## NetWare 4.x Q & A: Mounting a CD-ROM Drive

**I have a CD-ROM drive that I want to share and mount onto my NetWare 4.10 file server. What do I need to do?**

The first requirement is that the CD-ROM drive be a true SCSI or IDE CD-ROM drive. If the drive comes with its own controller, it may not be a SCSI or IDE CD-ROM drive. If the IDE CD-ROM drive does not have a jumper or switch selection for Master or Slave operation, it probably can't be used (especially if you already have an IDE hard drive in the server). The SCSI controller needs to be ASPI - compliant at the physical and software layers of the controller (i.e. an Adaptec, Bus Tech, or other controller--check Novell's NSEPro or NetWire for the latest list). Load the drivers to be able to mount the CD-ROM drive as a NetWare volume! In the STARTUP.NCF file for an Adaptec controller, load ASPITRAN.DSK and the appropriate Adaptec driver for the controller. In the AUTOEXEC.NCF file, load ASPICD.DSK or CDNASPI.DSK, and then load NWPA.DSK followed by CDROM.NLM. If everything is successful, you should see a drive deactivation message.

## RCONSOLE Error

**I am trying to run RCONSOLE from within a Windows DOS box. When I try this, I get a message that says operation will be unstable and I am dropped back out to DOS, or I get a blank screen when I exit RCONSOLE. How do I get this to work?**

Make sure the following lines are in your Windows SYSTEM.INI file under the 386ENH section:

    TimerCriticalSection=10000
    UniqueDOSPSP=TRUE
    PSPIncrement=5

These statements should take care of the problem. Another step to try, especially when RCONSOLE works most of the time, is to place a MaxBps=768 statement in your SYSTEM.INI file in the same section as the other statements.

## Upgrades and Passwords

**I am getting ready to upgrade from NetWare v3.x to 4.10. Having experienced previous upgrades, I am not happy about losing all my users' passwords. Is there some way to keep the passwords intact?**

You can keep your passwords if you do an In-Place Upgrade from the INSTALL.NLM. If you perform a Server-to-Server or Across-the-Wire migration, you will lose the passwords. If the In-Place Upgrade is attractive for you, be advised that due to the amount of conversion that occurs in memory, you may need to add additional memory to the server. Later versions of the In-Place Upgrade advise you about how much memory may be required but sometimes the recommendation is not enough. As always, be sure to have a good backup of your server before starting the upgrade.

## Logging into Two Trees

**Due to the manner in which our network was set up, we have a NetWare 4.01 server in one tree and a NetWare 4.10 server in another tree. The real problem is that I need to have users logged into both servers. When I try to log into the second server, regardless of which one it is, I am logged out of the first server. What am I doing wrong and how do I fix this?**

You can't be logged into more than one tree at a time. Once you have authenticated to one NetWare Directory Services (NDS) tree, you will only see the resources available in that tree. The best solution is to upgrade the NetWare 4.01 server to NetWare 4.10 and migrate it into the same tree as the current NetWare 4.10 server. You can attach to the server in the other tree bindery services mode only while logged into the server in the first tree.

## NetWare 4.x Q & A: Login Error Message

**When I log into our new NetWare 4.10 server, I get a message that says "Your current context is Root. User specified does not exist in this context." What is happening and how do I fix it?**

This message indicates that the server is unable to find a login ID with the name you are using at the root of the directory tree. To log in, you must use the fully qualified name (.CN=name.OU=organization_unit_name). You should check your NET.CFG file to see if a context statement is present. If there isn't, use the CX command to change your context until it is where you need to be. Then, using the NCUPDATE command, you can have NetWare automatically make the appropriate change to your NET.CFG file.

## NetWare 4.x Q & A: RCONSOLE and Windows

**I am trying to run RCONSOLE from within a Windows DOS box. When I try this, I get a message that says operation will be unstable and I am dropped back out to DOS, or I get a blank screen when I exit RCONSOLE. How do I get this to work?**

Make sure the following lines are in your Windows SYSTEM.INI file under the 386ENH section:

    TimerCriticalSection=10000
    UniqueDOSPSP=TRUE
    PSPIncrement=5

These statements should take care of the problem. Another step to try, especially when RCONSOLE works most of the time, is to place a MAXBPS=768 statement in your SYSTEM.INI file in the same section as the other statements.

# NetWare 4.x Q & A: NetWare 4.10 and 4.0 in Same Container

**I just installed a NetWare 4.10 server into the same container as my NetWare 4.0 server. Since doing this, I haven't been able to log into the network. What did I do wrong and how can I fix it?**

Novell has identified a problem placing a NetWare 4.10 server into the same context or container as a NetWare 4.02 or earlier server. You can have mixed servers in the same tree but not in the same context. Before migrating your NetWare 4.0 server to NetWare 4.10, download the latest version of DSREPAIR.NLM from NetWire as there have been problems identified with the version of DSREPAIR that shipped with versions of NetWare prior to NetWare 4.10.

## NetWare 4.x Q & A: Single Server Problems

**I am thinking about installing a single NetWare 4.10 server for my company. Will it provide any benefits that will make it worth the effort to put it in?**

Depending on the applications you use, such as e-mail, NetWare 4.10's NetWare Directory Services (NDS) may or may not gain much for you. As more and more applications tie into NDS, NetWare 4.10 will provide less manual configuration for administrators and more that can be performed with or NETADMIN is a good example of a single interface that uses NWADMIN to allow the administrator to create users and set them up in e-mail at the same time.

There are other features in NetWare 4.10 that will prove useful even in single-server installations. Suballocation is one of these. In suballocation, the server allows programs to "share" portions of a sector on the server's hard drive. While this may not appear to be beneficial, it can save tremendous amounts of disk space, especially when you have a large number of small files (30 kilobytes or less on the server's hard disk). Normally stored, these files would each be saved as 4,096 bytes each, tying up large parts of the disk and preventing the space from being used effectively.

A feature called disk compression in NetWare 4.10 allows Stacker-like savings on NetWare volumes. In disk compression, seldom-used files are compressed on the disk, and uncompressed as users request them. Disk compression must be used carefully as it is possible to lull yourself into a false sense of security; it may appear that you have more available disk space than you actually do. To improve performance and keep users from having to wait occasionally while seldom-used files are decompressed, it might be worthwhile to flag certain directories that will not be compressed.

## NetWare 4.x Q & A: Medium to High Server Utilization and No User Activity

**I am noticing extended periods of medium to high server utilization in my NetWare 4.10 network when users are generating no activity. What is happening?**

You are probably seeing background compression occurring to files that have been deleted. This is a process that occurs normally and shouldn't affect users. NetWare performs compression to free as much space as possible for file storage. Compression also reduces the amount of memory required to cache deleted files. If this operation is impacting server performance, run the PURGE command from the root of each volume and specify the /ALL option, which forces PURGE to automatically work its way down the directory tree.

## NetWare 4.x Q & A: Converting from NNS

**I am converting from Novell Name Service (NNS) to NetWare 4.10. I have users that need to log into multiple servers. How do I accomplish this in NetWare 4.10?**

NetWare 4.10 is different than NNS. In NetWare 4.10, you log into the network instead of to multiple servers. Although you will still attach to a server when you log into the network, you will not have to log in or authenticate to the other servers you need to access. NetWare Directory Services (NDS) automatically performs this operation when you need to map a drive to a server or receive access to a service you aren't already using. NDS handles the authentication in the background without user intervention. It doesn't have the problems synchronizing multiple binderies into a single global database that NetWare v3.x has.

## NetWare 4.x Q & A: CD-ROM Drive Not Recognized

**Intermittently, NetWare will not recognize the CD-ROM drive attached to my NetWare 4.10 server when loading CDROM.NLM. Unloading and reloading the CD-ROM driver usually fixes the problem. What is occurring and how do I fix it?**

The CD-ROM drive is not responding to the SCSI ID inquiry fast enough. This problem can occur when the drive has powered down because of inactivity. Place the SCAN FOR NEW DEVICES command in the server's AUTOEXEC.NCF file just before loading the CDROM.NLM. This command forces the server to check the SCSI controllers for devices it doesn't already know about.

# NetWare 4.x Q & A: Restarting the Server Faster

**I just made some changes to the server that require downing the server, exiting to DOS, and re-executing the SERVER.EXE command. Is there a faster way to bring the server back up than going through this whole process?**

You may be able to save time by issuing the DOWN command followed by the RESTART SERVER command. This process recycles the server without requiring a complete exit to DOS. It will reread the STARTUP.NCF and AUTOEXEC.NCF files just as if you were starting the server from scratch.

## NetWare 4.x Q & A: DSREPAIR; Upgrading the Server

**I have started preparing our servers for upgrading to NetWare 4.10 from NetWare 4.02. I have installed DSREPAIR v2.23. One of the servers won't release directory services. We have tried reloading NetWare Directory Services (NDS) on all the servers without luck. Do you have any suggestions?**

A possible option is to put each server into a separate partition. Temporarily, make sure that each server has no partition replica on any of the other servers. Try running DSREPAIR on each server. You will need to move each of your NetWare 4.02 servers to a temporary separate partition prior to upgrading to 4.10.

There is a known problem trying to run a NetWare 4.10 server in the same partition as a NetWare 4.01 or 4.02 server. After you've upgraded each server to 4.10, you can move them into a common partition.

# NetWare 4.x Procedure List

[Creating Print Services with PCONSOLE](#)

[Recovering a Deleted File in NetWare 4.x](#)

## NetWare 4.x Procedure: Recovering a Deleted File in NetWare 4.x

1. Change to the directory where the deleted file resides.

2. Run FILER.

3. Select Salvage Deleted files and press the Enter key.

4. Select View/Recover Deleted Files and press the Enter key.

5. Press the Enter key when the Pattern to Match box appears on the screen.

6. Highlight File Name to Recover and press the Enter key.

7. Answer Yes to Recover This File question.

## Creating Print Services with PCONSOLE

1. Log in as ADMIN or equivalent.

2. Execute PCONSOLE.

3. Select Quick Setup.

4. Enter the print server name. It should be this format: PS-organization name or organizational unit name.

5. Add the new printer as P1. When you add subsequent printers, increase this name by increments of 1.

6. Add the new print queue name. It should be Q1. When you add subsequent queues, increase this name by increments of 1: Q2, Q3, and so on.

7. By default, print queues are saved in the SYS volume. You can change this default if you want.

8. By default, the banner type is Text. You can change this to PostScript if you have a PostScript printer.

9. By default, the printer type is Parallel. Other options are Serial, UNIX, and AppleTalk.

10. The location of the printer is Manual Load, which indicates that the printer will be attached to a workstation and will use NPRINTER to make itself available for network use. If the printer will be attached to the server, you need to change the location to Auto Load (local) to be able to invoke NPRINTER.NLM.

11. The interrupt is set to None (polled mode). This option should be left as is unless you have problems with printing speed.

12. The port is LPT1 by default. Change this option only if your printer will be residing on LPT2 or COM1.

13. When you finish, press Esc and enter Yes to save.

14. At the file server console, enter LOAD PSERVER PS-ORGANIZATION NAME and press the Enter key. PSERVER.NLM will load and log in the printer to the network. It will take a non-licensed connection on the server for PSERVER.NLM and a connection for each printer it will be servicing. You may want to enter this same load line in the server's AUTOEXEC.NCF file to allow

PSERVER.NLM to automatically load each time the server comes online.

15. Invoke the CAPTURE command at the workstation or set up a CAPTURE statement in the NetWare client software you are using. Begin printing.

## NetWare 4.x Requirements

**Server requirements:**

- CPU: 386 or later (DX is preferred, but SX will work. If several NetWare Loadable Modules, such as Global MHS, will be loaded, a 486 will perform better than a 386.)

- Memory: 12 MB

- Disk space: 250 MB (This will leave about 100 MB available if online documentation is installed.)

- CD-ROM: To be mountable as a NetWare volume, the CD-ROM drive must be a true SCSI drive that will connect to an Adaptec SCSI hard drive controller. If the CD-ROM drive has an IDE interface and has the jumpers for master/slave operation, it can be used as a NetWare-mountable volume after you download a special driver from NetWire. If the CD-ROM drive comes with its own controller, you will be able to use the drive to install software from it only.

**Client Requirements:**

- DOS: DOS 3.1 or later and the NetWare Client for DOS

- Windows: Microsoft Windows 3.0 or later, DOS 3.1 or later, and the NetWare Client for DOS

- OS/2: OS/2 1.1 or later (Standard or Extended Edition); OS/2 2.11 or OS/2 Warp will work, but require the updated OS/2 Requester from NetWire.

- Macintosh: Macintosh Operating System 6.0 or later

## NetWare 4.x Network Utilities

AuditTrack v2.04 by On Technology (Free 30-Day Trial)

AuditWare from Preferred Systems

BrightWorks from McAfee

Close-Up/LAN Pro v6.1 from Norton-Lambert

Common Knowledge by On Technology (Free 30-Day Trial)

DaVinci eMAIL by On Technology (Free 30-Day Trial)

DS Standard from Preferred Systems

John T. McCann's SofTrack by On Technology (Free 30-Day Trial)

LAN Inventory from McAfee

LAN Support Center from McAfee

Meeting Maker XP Cross Platform Group Scheduler from On Technology (Free 30-Day Trial)

NCAP11 by Darwin Collins

NENV10 and NLOGIN by Darwin Collins

NetLauncher v1.0 FC3 from CompuServe

NetShield from McAfee

NetTools from McAfee

NetTunePRO from HawkNet

NMENU335 by Dirk Engelhardt

Notework Electronic Mail by On Technology (Free 30-Day Trial)

REGMEM_ZIP

SiteExpress from McAfee

[SiteMeter from McAfee](#)

[Software Sentry by Microsystems Software](#)

[TAPCIS from the Support Group](#)

[TCPRINT--Host TCP/IP Printer Server for NetWare](#)

[VirusScan for Windows 95 from McAfee](#)

[VirusScan from McAfee](#)

[WHOHASIT by Andrew Cobb](#)

[WINCIM 1.4 Novell Edition from CompuServe](#)

[WINMENU GE v2.4 for All Networks](#)

# NetWare 4.x Utility: DS Standard from Preferred Systems

Powerful Daily NDS Management with a Safety Net

DS Standard NDS Manager is a Windows-based, off-line NDS management tool. Using DS Standard, network managers make changes to a back-end database, not the "live" network.   With its powerful database capabilities, DS Standard reduces the time required to manage NDS, makes migrations as easy as drag-and-drop, and with over 100,000 copies in distribution, DS Standard is the premier NDS management tool available today!

To run DS Standard NDS Manager, copy the directory \PROGRAMS\PSI\DSINST to your hard disk. Then use the File Run option in Windows. Type SETUP.

Your DS Standard NDS Manager license expires on (January 15, 1996).   To purchase a copy of DS Standard software, or to renew this license, please contact your PSI representative at (203) 937-3000.

Thank you for your interest in software from Preferred Systems, Inc.!

# NetWare 4.x Utility: AuditWare from Preferred Systems

Automated Reporting Tools for the Enterprise

AuditWare is a Windows-based reporting tool for Novell NetWare.   It is the first available tool that provides true multi-server support.   And since configurations are captured to a database, it alleviates network degradation caused by most other reporting tools.   A Windows-based custom report writer enable exception reporting, and AuditWare's extensible architecture allows external databases to be linked into any report.

Your AuditWare license expires on (January 15, 1996).   To purchase a copy of AuditWare software, or to renew this license, please contact your PSI representative at (203) 937-3000.

Thank you for your interest in software from Preferred Systems, Inc.!

To install AuditWare, copy the directory \PROGRAMS\PSI\AUDIT to your hard disk, and choose the File Run option in Windows. Type in SETUP.

## NetWare 4.x Utility: Software Sentry by Microsystems Software

Software Sentry from Microsystems Software Inc. Is a license metering and software asset management package for any network, including NetWare.

To install Software Sentry, copy the subdirectory \PROGRAMS\MICROSYS to your hard disk. From the File Run command, type SETUP.

## NetWare 4.x Utility: WINMENU GE v2.4 for All Networks



Requires Windows 3.1 or above.

Winmenu is a state-of-the-art menu program for Windows users designed to facilitate access to all applications and provide authorized access for the users. LAN sites that are contemplating to move to the   Windows environment will find Winmenu a must. Winmenu provides easy and intuitive access without the complications of the Program Manager. The greatest advantages of Winmenu are its ability to ease administration tasks and provide authorized access based on the group codes the user belongs to. It is cost-effective and looks great!

Please read the WINMENU.TXT file for more information.

To install it, copy the D:\PROGRAMS\WINMENUG directory to your hard disk.

Copyright by Ricky Freyre, 1995 / All rights reserved.
Compuserve# 70154,2635
Internet:   70154.2635@compuserve.com

## NetWare 4.x Utility: NMENU335 by Dirk Engelhardt

NovMenu v3.35 is a menu system for NetWare.

To install it, copy the directory \PROGRAMS\NMENU335 to the SYS:SYSTEM directory on your file server.

## NetWare 4.x Utility: WHOHASIT by Andrew Cobb



WHOHASIT displays the files a workstation is using on a NetWare network, including volume use. It also allows you to send broadcast messages.

To run it, copy the directory \PROGRAMS\WHOHASIT to your hard disk. WHOHASIT is a Windows utility. To install it, type WHOHASIT.EXE from the File Run option in Windows.

## NetWare 4.x Utility: TCPRINT--Host TCP/IP Printer Server for NetWare



TCPrint is a printer server that resides on a NetWare file server and complies with RFC1179 protocol for a Line Printer Daemon (LPD).

All hosts that support the TCP/IP LPD protocol can assign their print jobs into the NetWare server's print queues directly via TCPrint. There is no additional software required for those hosts.

Users can assign their jobs transparently just as if they are printing on host. All processes will be done by host and TCPrint.

Also, TCPrint performs UNIX to DOS ASCII text translation automatically.

It also provides LPQ and LPRM commands. Some UNIX systems didn't interpret job status data more than two lines long when the LPQ command was issued. Please contact the author if this situation occurs. This version has been tested for NetWare 3.x and 4.x. It doesn't need too much expertise for installation.

To install it copy the D:\PROGRAMS\TCPRINT directory to your hard disk.

Please read the README.DOC file for more information.

## NetWare 4.1 Utility: NENV10 and NLOGIN by Darwin Collins

This package documents the methods we use to automatically maintain the workstation network drivers, applications, and other workstation files.

It also includes NLOGIN.EXE, a Netware 4.1 utility, that makes it easier for users to login to a NetWare 4.10 server. NLOGIN.EXE will search the user's 'short' login name in the NetWare Directory Services (NDS) tree and return the full NDS name so that it can be used for Novell's LOGIN.EXE. The purpose of this package is to aid other Network administrators in setting standards, batch files, and utilities and to make the maintenance of workstation network drivers and miscellaneous files painless.

For example, whenever, we receive a newer mouse driver, VLMUP*, or Windows 3.1 patches, we can easily distribute these files to all our workstations. (We usually test them for a week or two on one server before we copy them to other servers and sites).

However, for more complicated installations or anything to do with Windows, such as Lotus Smartsuite, Novell's WIN2NCS, CorelDraw, PCAnywhere, SPSS for Windows, or the Oracle client, we use a package called WinInstall 4.0. You can obtain WinInstall 4.0 by contacting us at (301)270-4458 or CompuServe 71371,635.

To install these utilities, copy the D:\PROGRAMS\NVEN10 directory to your hard disk.

Please read the README.TXT file for more information.

## NetWare 4.x Utility: NCAP11 by Darwin Collins



This printer redirection utility is designed to work with NetWare 4.10.

It displays to the network user a pick list of all allowable (accessible) network print queues and print job names, and allows the user to redirect his or her LPT ports to the desired choice. These choices can be saved by the user for later use. (e.g., activated upon network login). NCAP11 is fully compatible with NetWare 4.1's NetWare Directory Services. It does not use bindery emulation.

To install it, copy the D:\PROGRAMS\NCAP11 directory to your hard disk.

Please read NCAPTURE.TXT for more information.

## NetWare 4.x Utility: NetWare AuditTrack v2.04 by On Technology (Free 30-Day Trial)

AuditTrack v2.04, a NetWare auditing product, is a network surveillance system that allows LAN administrators to track and identify all login, file, remote access, and bindery activity occurring anywhere on a NetWare network.

To install this software, copy the directory D:\PROGRAMS\AUDITTR to your hard disk. Then run the SETUP program from the Windows Program Manager File Run command line. If your hard drive is designated as drive C, type C:\AUDITTR\ setup.exe and choose OK.

## NetWare 4.x Utility: BrightWorks 2.0 from McAfee



BrightWorks 2.0, an integrated enterprise network management suite for NetWare v3.x and 4.x networks, includes server monitoring, server performance tuning, help desk, and advanced scripting modules, as well as enterprise metering, inventory, and software distribution capabilities.

To install this software, copy the directory D:\PROGRAMS\MCAFEE\BWORKS to your hard disk. Then run the SETUP program from the Windows Program Manager File Run command line. If your hard drive is designated as drive C, type C:\mCAFEE\BWORKS\setup.exe and choose OK.

# NetWare 4.x Utility: Close-Up/LAN Pro v6.1 from Norton-Lambert

This is a timed evaluation that includes two fully running programs: the Close-Up modem remote communications package and the Close-Up/LAN Pro network remote communications package. Users can demo the Close-Up modem product, the Close-Up/LAN Pro network product, or both products simultaneously.

A README file is included that is a manual and quick reference guide for operating both Close-Up and Close-Up/LAN Pro modem and network programs.

**Requirements:**

- Hardware: IBM PCs, ATs, XTs, PS/2s, or 100 percent compatibles
- Operating System: MS or PC DOS 3.3 or later
- Windows (Optional): Windows 3.1 or 3.11; Windows for Workgroups 3.11
- Mouse (optional): Microsoft mouse or 100 percent compatibles
- Network (optional): NetWare or any popular network
- Modems: Point and Select from over 800 modems
- Monitors: Monochrome through SVGA
- Memory: Close-Up Host OK (with UMBs) or 42 kilobytes (KB), remote 375KB Close-Up/LAN Pro Host OK (with UMBs) or 47KB, remote 375KB
- Hard disk: Recommended
- **Note**: Two machines are required to establish a remote connection.

Installation:

To install, copy the directory D:\PROGRAMS\NORTON to your hard disk. Type CINSTALL at the DOS prompt.

## NetWare 4.x Utility: Common Knowledge by On Technology (Free 30-Day Trial)

Common Knowledge, a collaborative groupware product for sharing information and documents, allows users to create, access, edit, distribute, and share information over a network while providing a structure for managing and tracking the input of workgroup participants.

To install this software, copy the directory D:\PROGRAMS\COMMON to your hard disk. Then run the SETUP program from the Windows Program Manager File Run command line. If your hard drive is designated as drive C, type C:\ common\setup.exe and choose OK.

## NetWare 4.x Utility: DaVinci eMAIL by On Technology (Free 30-Day Trial)

DaVinci eMAIL includes NetWare Directory Services (NDS) support as well as NetWare MHS-based electronic mail capability for DOS, Windows, and Macintosh environments.

To install DaVinci eMAIL, copy the subdirectory D:\PROGRAMS\DAVINCI to your hard disk. From the hard disk, follow these installation instructions:

1. Log in as "ADMIN" on a 386 or higher PC-compatible workstation with at least 2 megabytes (MB) of RAM and DOS 3.3 or higher.

If you do not have an ADMIN user name with supervisory rights on the network, you can use any user name that has supervisor equivalence.

2. Run Windows.

3. Select RUN from the File menu.

4. Click on the Browse button to select the drive that contain the subdirectory containing the files you copied from the CD-ROM, then select SETUP.EXE and click on OK.

Example: C:\DAVINCI\SETUPWIN.EXE

5. Click on the OK button.

6. Read the introduction at the bottom of the Setup screen, then click on the Install DaVinci eMAIL button.

7. Click on the Browse button if you wish to change the eMAIL installation.

Specify a different location for the new eMAIL installation, including the name of the directory for eMAIL itself.

Example: M:\PUBLIC\DAVINCI

Note: Make sure the path you specify is accessible to all your users; all users should have a drive mapped to that SERVER/VOLUME. Use a drive letter and a complete path syntax for the installation, not server/volume syntax. The Browse feature will help you avoid typos and incorrect syntax.

8. Click on the OK button.

The SETUP program will display the Disk Space Required to install the eMAIL program and its files.

9. Click on the Install button to continue.

Follow the instructions on the screen while the SETUP program installs eMAIL.

After SETUP finishes, you will be returned to the Windows Program Manager for a few seconds as SETUP closes and ADMIN loads.

## NetWare 4.x Utility: John T. McCann's SofTrack by On Technology (Free 30-day Trial)

SofTrack, a software metering package, includes native support for Novell's NetWare Directory Services (NDS).

To install this software, copy the directory D:\PROGRAMS\SOFTRACK to your hard disk. Then run the INSTALL program from the Windows Program Manager File Run command line. If your hard drive is designated as drive C, type C:\softrack\install.exe and choose OK.

## NetWare 4.x Utility: LAN Inventory from McAfee

BrightWorks LAN Inventory automates the collection, consolidation, analysis, and reporting of LAN asset information and provides support for Compaq's Intelligent Manageability strategy, as well as distributed PC assets.

To install this software, copy the directory D:\PROGRAMS\MCAFEE\LANINV and D:\PROGRAMS\MCAFEE\HELP to your hard disk. Then run the SETUP program from the Windows Program Manager File Run command line. If your hard drive is designated as drive C, type C:\LANINV\setup.exe and choose OK.

## NetWare 4.x Utility: LAN Support Center from McAfee



LAN Support Center, a help desk package, helps administrators automate the collection, tracking, and analysis of end-user support requests.

To install this software, copy the directory D:\PROGRAMS\MCAFEE\LANSUP and the subdirectories under it to your hard disk. Then run the SETUP program from the Windows Program Manager File Run command line. If your hard drive is designated as drive C, type C:\LANSUP\setup.exe and choose OK.

## NetWare 4.x Utility: Meeting Maker XP Cross Platform Group Scheduler by On Technology (Free 30-Day Trial)

Meeting Maker XP, group scheduling software, includes LAN and Internet support, as well as other e-mail integration features.

To install this software, copy the directory D:\PROGRAMS\MEETING to your hard disk. Then run the SETUP program from the Windows Program Manager File Run command line. If your hard drive is designated as drive C, type C:\ MEETING\setup.exe and choose OK.

## NetWare 4.x Utility: NetLauncher v1.0 FC3 from CompuServe

NetLauncher v1.0 is Internet access software for CompuServe.

To install this software, copy the directory D:\PROGRAMS\NETLAUNC to your hard disk. Then run the SETUP program from the Windows Program Manager File Run command line. If your CD-ROM drive is designated as drive D, type d:\ netlaunc\setup.exe and choose OK.

## NetWare 4.x Utility: NetShield 2.2 from McAfee

NetShield 2.2 for NetWare is an anti-virus package for DOS, Windows, and OS/2. The new release includes Novell NetWare 4.1 support, enhanced notification options, a Windows console, administrator access controls, and increased scanning and detection performance.

To install this software, copy the directory D:\PROGRAMS\MCAFEE\NSH to your hard disk. Then run the SETUP program from the Windows Program Manager File Run command line. If your hard drive is designated as drive C, type C:\ MCAFEE\NSH\setup.exe and choose OK.

## NetWare 4.x Utility: NetTools from McAfee



NetTools, a Windows Desktop Management solution, includes global management capabilities and NDS support, as well as, menu administration, print management, software distribution and workstation security.

To install this software, copy the directory D:\PROGRAMS\MCAFEE\NTOOLS to your hard disk. Then run the SETUP program from the Windows Program Manager File Run command line. If your hard drive is designated as drive C, type C:\ntools\setupM.exe and choose OK.

## NetWare 4.x Utility: NetTunePRO from HawkNet



NetTunePRO is performance tuning and monitoring software for NetWare 4.1.

You can receive an evaluation of this product from HawkNet's World Wide Web site at http://www.hawknet.com/~netinfo.

## NetWare 4.x Utility: Notework Electronic Mail by On Technology (Free 30-Day Trial)



Notework Electronic Mail includes support for Macintosh, Windows NT, DOS, and Windows 3.1 clients.

To install this software, copy the directory D:\PROGRAMS\NOTEWORK to your hard disk. Then run the INSTALL.BAT file from the Windows Program Manager File Run command line. If your hard drive is designated as drive C, type C:\notework\install.bat and choose OK.

## NetWare 4.x Utility: SiteExpress from McAfee



SiteExpress is an Electronic Software Distribution package that contains enterprise software distribution capabilities, as well as management reports

To install this software, copy the directory D:\PROGRAMS\MCAFEE\SITEXP to your hard disk. Then run the SETUP program from the Windows Program Manager File Run command line. If your hard drive is designated as drive C, type C:\sitexp\setup.exe and choose OK.

## NetWare 4.x Utility: SiteMeter from McAfee

SiteMeter is an enterprise-wide software metering tool that supports global reporting of application license compliance and usage as well as consolidation of reporting of metering data from multiple servers and locations and anti-virus functions.

To install this software, copy the directory D:\PROGRAMS\MCAFEE\SITEMTER and the subdirectories below it to your hard disk. Then run the SETUP program from the Windows Program Manager File Run command line. If your hard drive is designated as drive C, type C:\sitemtEr\setup.exe and choose OK.

## NetWare 4.x Utility: TAPCIS from the Support Group

TAPCIS is an access program for CompuServe that allows you to automate the work you would normally do manually such as reading messages and writing messages, sending and retrieving e-mail, and downloading and uploading files.

To install this software, copy the directory D:\PROGRAMS\TAPCIS to your hard disk. Then run the TAPTRY.EXE program from the Windows Program Manager File Run command line. If your hard drive is designated as drive C, type C:\ TAPCIS\TAPTRY.EXE and choose OK.

## NetWare 4.x Utility: VirusScan for Windows 95 from McAfee

VirusScan for Windows 95, a native 32-bit anti-virus solution, exploits the new capabilities of Windows 95.

To install this software, copy the directory D:\PROGRAMS\MCAFEE\S95 to your hard disk. Then run the SETUP program from the Windows Program Manager File Run command line. If your hard drive is designated as drive C, type C:\S95 \ 100E.exe and choose OK.

## NetWare 4.x Utility: VirusScan from McAfee

VirusScan is an anti-virus package from McAfee for NetWare LANs.

To install this software, copy the directory D:\PROGRAMS\MCAFEE\WSC to your hard disk. Then run the SETUP program from the Windows Program Manager File Run command line. If your hard drive is designated as drive C, type C:\WSC\ setup.exe and choose OK.

# NetWare 4.x Utility: WINCIM 1.4 Novell Edition from CompuServe



WINCIM is Windows-based access software for CompuServe.

To install this software, copy the directory D:\PROGRAMS\WINCIM to your hard disk. Then run the SETUP program from the Windows Program Manager File Run command line. If your hard disk is designated as drive C, type c:\wincim\ setup.exe and choose OK.

# REGMEM.ZIP



This utility tells you how to use the REGISTER MEMORY command. To install it, copy it to your hard disk and unzip it. Then, from the File Run menu of Windows, enter the executable REGMEM.EXE. REGMEM takes 1.1 megabytes of disk space.

# NetWare 4.x Demos

[Ontrack Data Recovery Slideshow](Ontrack Data Recovery Slideshow)

## NetWare 4.x: NetWare 4.x Demo: Ontrack Data Recovery Slideshow

The Ontrack Volume Repair Detector package is designed to inform NetWare supervisors and system administrators about safe methods for recovering from NetWare volume corruption. The package contains two sections, a Novell NLM that detects the loading of VREPAIR, and a slideshow presentation which educates users on data security. The NLM warns supervisors to make certain that backups are adequate before attempting any repairs that could permanently damage critical files. The slideshow provides screen shots from the Ontrack Data Recovery for NetWare data recovery and protection utility.

To view the slideshow, run D:\PROGRAMS\ONTRACK\SLIDESHW.EXE from the File Run option of the Windows Program Manager.

# NetWare 4.x CNA / CNE Questions

What is the minimum amount of RAM needed on a NetWare 4.x file server?

1. 8 megabytes
2. 12 megabytes
3. 16 megabytes
4. 24 megabytes

To which area are bad blocks written to in NetWare 4.10?

1. To the File Allocation Table
2. To the Directory Entry Table
3. To the Hot Fix Redirection Area
4. To the Bad Block Redirection Table

Which utilities are used to customize print jobs?

1. PRINTCON, PCONSOLE
2. PRINTDEF, PCONSOLE
3. PRINTDEF, PRINTCON
4. PRINTCON, PSC

Which utilities are used to redirect print jobs?

1. CAPTURE, NPRINT
2. CAPTURE, RPRINTER
3. RPRINTER, PSC
4. PCONSOLE, PSC

Which modules must be loaded on the server to implement remote console management?

　　1. REMOTE.NLM, SPXS.NLM
　　2. SPXS.NLM, CONTROL.NLM
　　3. REMOTE.NLM, RS232.NLM
　　4. REMOTE.NLM, RSPX.NLM

Which utility is used to add users to the server?

　　1. SYSCON
　　2. NETADMIN
　　3. NWADMIN
　　4. NETUSER

Which utility allows you to see the files a user has open?

　　1. SYSCON
　　2. FCONSOLE
　　3. MONITOR
　　4. FILEMON

Why is ETHERNET_802.2 the default frame type for NetWare 4.10?

　　1. It is faster than ETHERNET_802.3.
　　2. It has fewer routing problems than ETHERNET_802.3.
　　3. ETHERNET_II is harder to implement than ETHERNET_802.2.
　　4. Ethernet_SNAP is only used by Macintoshes.

How many network adapters does NetWare 4.10 support?

1. 2
2. 4
3. 6
4. Limited by available interrupts



What utility streamlines the handling of loading and binding LAN drivers?

1. INETCFG.NLM
2. INSTALL.NLM
3. NWADMIN.EXE
4. MONITOR.NLM



What is the default block size when creating a volume?

1. 8KB
2. 32KB
3. 64KB
4. 16KB



What is the default volume name for the first volume created?

1. SYS
2. NDS_PRIMARY
3. VOL_NDS
4. SYSTEM



What utility can change the SET commands used on the server?

1. NWADMIN
2. SERVMAN

3. SESSION
4. PCONSOLE

What utility allows users to map drives and capture printers?

1. SESSION
2. NETUSER
3. SYSCON
4. NWTOOLS

What statement in the NET.CFG file controls the first drive letter mapped to the server?

1. FIRST DRIVE
2. FIRST NETWORK DRIVE
3. NETWORK DRIVE
4. DRIVE

What statement is inserted into the config.sys file by the VLM client install?

1. lastdrive = z
2. lastdrive = e
3. buffers = 30
4. files = 25

Which console command allows you to see all servers on the internetwork?

1. track on
2. reset router
3. display servers
4. display networks

Which console command displays all SAP/RIP activity on the network?

1. track on
2. display networks
3. display routes
4. display servers

Which utility allows you to back up the server to a workstation?

1. SBACKUP
2. NDSBACK
3. BACKUP
4. No such utility

What command allows for the context to be changed from the command line?

1. CT
2. CX
3. CONTEXT
4. XT

The correct answer is #2: 12 megabytes.

The correct answer is #3: The Hot Fix Redirection Area.

The correct answer is #2: PRINTDEF, PCONSOLE.

The correct answer is #1: CAPTURE, NPRINT.

The correct answer is #4: REMOTE.NLM, RSPX.NLM.

The correct answer is #1: SYSCON.

The correct answer is #3: MONITOR.

The correct answer is #2: It has fewer routing problems than ETHERNET_802.3.

The correct answer is #4: Limited by available interrupts.

The correct answer is #1: INETCFG.NLM.

The correct answer is #3: 64KB.

The correct answer is #1: SYS.

The correct answer is #2: SERVMAN.

The correct answer is #1: SESSION.

The correct answer is #2: FIRST NETWORK DRIVE.

The correct answer is #1: lastdrive = z.

The correct answer is #3: display servers.

The correct answer is #1: track on.

The correct answer is #4: No such utility.

The correct answer is #2: CX.

## SFT Level III



CD HELPdesk Series: Novell Products

Click on any icon for more information

Q+A  PROCEDURE LIST  REQUIRED

VENDOR LIST

Copyright   1995. Charles River Media. All Rights Reserved.

## SFT Level III Q & A

Location of Tape Drive

MSL Adapters and Cabling Type

Redundant Links and MSL Adapters

SFT Level III Definition

UPS Use on SFT Level III Servers

Using Different MSL Adapters

## SFT Level III Q & A: SFT Level III Definition

**What is SFT Level III and how does it work?**

SFT Level III stands for System Fault Tolerance Level III. It is also coined as server mirroring because that's exactly what it provides. File servers that are considered mission-critical and need to be running seven days a week, 24 hours a day (7/24) are prime targets for this level of system fault tolerance.

NetWare SFT Level III permits a primary server to be mirrored onto a secondary server through a Mirrored Server Link (MSL), which is similar to mirroring disk drives. Every change that's written to the primary server is also recorded onto the secondary server. If the primary server fails, the secondary server immediately takes over.

The NetWare SFT Level III operating system is designed differently than NetWare because it has to be able to handle communications between two servers at one time. The operating system is split into two components: the Mirrored Server Engine and I/O Engine. Both engines are loaded onto both the primary and secondary servers, with only the mirrored server engines mirrored. The I/O engines are maintained separately so a hardware fault on one server does not affect the other.

Both the primary and secondary servers connect onto the network, with each server monitoring the status of the other through the MSL link, as well as through the network connection. Through the MSL link, they monitor the up or down status of each other. Through the network connection, each server monitors the NetWare Core Protocol (NCP) acknowledgments of the other server. If the secondary server can detect NCP traffic through the network link but can't see any traffic through the MSL link, it notifies the other server that the MSL link must be down.

# SFT Level III Q & A: MSL Adapters and Cabling Type

**I am getting ready to buy Mirrored Server Link (MSL***)* **adapters for our upcoming SFT Level III installation. There are two types of adapters--coax and fiber. Which adapters would be better to use?**

It depends on the type of installation you are performing. If the servers will be in the same room, coaxial adapters would be fine and probably less expensive to connect. If the servers will be in different rooms or on different power feeds, in which there is a possibility of a ground potential difference, fiber-optic adapters would be better as they will electrically isolate the servers.

## SFT Level III Q & A: Redundant Links and MSL Adapters

**I noticed in the Mirrored Server Link (MSL) adapter documentation in NetWare 4.10 that a second or redundant link is supported. Do I have to use the MSL cards for this second link?**

Novell supports the use of NE2000-compatible adapters for the second link. When you use this type of adapter as a redundant link, it is meant for temporary short-term use. The throughput will be substantially less for the NE2000 adapter than for the higher-speed MSL adapter.

## SFT Level III Q & A: UPS Use on SFT Level III Servers

**We have an uninterruptible power supply (UPS) that can support multiple file servers. Can we use it on our SFT Level III servers?**

You can, but you will be introducing a single point of failure into the network. If the UPS fails, both servers could go down at once, defeating the purpose of SFT Level III. Although it will be a little more expensive, you will receive better protection by using a separate UPS for each server.

# SFT Level III Q & A: Using Different MSL Adapters

**One of our Mirrored Server Link (MSL) adapters failed, but the backup link saved the day. Our local dealer can't get a replacement MSL adapter for several weeks. He has another brand in stock. Can we use this in place of the failed adapter?**

Probably not. Most MSL adapters are proprietary (i.e. you have to have the same adapter at both ends of the link). You can check with the technical support people at either adapter company to verify this, but I believe the answer will be no.

## SFT Level III Q & A: Location of Tape Drive

**We are getting ready to install SFT Level III. In which server should we locate the tape drive?**

It would be better to locate the tape drive on a different server or NetWare Runtime server. The problem with locating the tape drive in one of the SFT Level III servers is that if the server containing the tape drive goes down, you have no way to back up the server (unless you put a tape drive in both servers).

# SFT Level III Procedure List

Installing SFT Level III with no NetWare 4.10 Server Present

## SFT Level III Procedure: Installing SFT Level III with No NetWare 4.10 Server Present

1. Verify that both servers are constructed identically (same hard drives, same amount of memory, etc.).

2. Install MSL boards (NE2000s are okay for testing or redundant MSL link) and connect them together.

3. Boot both servers from DOS.

4. Switch to the driver letter corresponding to the CD-ROM drive on the lead server.

5. Type INSTALL and press the Enter key.

6. Select NetWare Server Installation and press the Enter key.

7. Select NetWare 4.10 Server and press the Enter key.

8. Select Simple Installation of NetWare 4.10 and press the Enter key.

9. Type the server name and press the Enter key.

10. Select the driver for the hard disk controller you are using and press the Enter key.

11. Select Save Parameters and Continue, press the Enter key.

12. Select N and press the Enter key if no additional hard disk drivers are needed; then proceed to Step 15.

13. Select Y and press the Enter key to load additional disk drivers.

14. Load additional drivers and press N when finished.

15. Select LAN Driver(s) (for the network adapter not the MSL adapter) Present in the Server and press the Enter key.

16. Press Select/Modify Parameters if needed to reflect what the adapter is set to and press the Enter key.

17. Press F10 when finished.

18. Select Save Parameters and Continue.

19. If you have additional adapters to configure, press Y, press the Enter key and go to Step 15.

20. If no additional adapters are present, press N and press the Enter key.

21. Select Continue Installation and press the Enter key.

22. When prompted, insert the NetWare 4.10 license diskette and press the Enter key.

23. Select Y if this is the first NetWare 4.10 server, and press the Enter key.

24. Select Correct Time Zone and press the Enter key.

25. Type the organization name and press the Enter key.

26. Type the ADMIN password and press the Enter key.

27. Retype the ADMIN password and press the Enter key.

28. Press the Enter key to continue.

29. While files are being copied to the SYS: volume, format three high-density diskettes.

30. Select Continue Installation and press the Enter key.

31. Press the Enter key to exit install.

32. Down the server and exit to DOS.

33. Execute SERVER.EXE to verify that the server is functional.

34. Down the server and exit to DOS.

35. Switch to the drive letter for the CD-ROM.

36. Type INSTALL and press the Enter key.

37. Select NetWare Server Installation and press the Enter key.

38. Select NetWare 4.10 SFT III and press the Enter key.

39. Select Convert NetWare 4.10 to SFT III and press the Enter key.

40. Confirm the MS Engine Name and press the Enter key.

41. Press the Enter key after reading the message about naming the IO Engines.

42. Review the internal IPX numbers and press the Enter key to continue with the installation.

43. Confirm the path to copy SFT III files to and press the Enter key to continue.

44. Verify the path for the AUTOEXEC.BAT file and press the Enter key.

45. Verify the drive letter for diskette drive.

46. Insert the first of the three blank formatted diskettes and press the Enter key.

47. Select the MSL card when prompted (for NE2000 adapters, select HNE2000.MSL).

48. If the adapter is not listed, press Ins to install the desired driver.

49. Press the Enter key if prompted to enter needed parameters for the MSL adapter.

50. If you will be using a redundant MSL link, press Y, then press the Enter key and go to Step 48.

51. Type N and press the Enter key.

52. Boot the second server to DOS.

53. Insert the first of the three floppies.

54. Type INSTALL and press the Enter key.

55. Insert additional diskettes when prompted and press the Enter key.

56. On the second server, select MSL Card Installed and press the Enter key.

57. Press the Enter key to switch to the console screen.

58. Enter the required parameters for the MSL adapter and press the Enter key.

59. If you are using a redundant MSL link, select Y to load the additional MSL driver, then go to Step 57.

60. Type N and press the Enter key.

61. Verify that the appropriate disk and LAN drivers are selected for both IO Engines; select them if they are not showing.

62. Selection Continue Installation and press the Enter key.

63. The hard disk and LAN drivers will load and then will create the NetWare partition on the second server and establish the mirroring sequence between servers.

## SFT Level III Requirements

- Identical hardware on both servers, including video, RAM and disk drive space

- Mirrored Server Link Adapters and LAN drivers

- Cable

- SFT Level III

## Vendor List

3Com Corp.
5400 Bayfront Plaza
Santa Clara, CA 95052-8145
(800) NET-3COM or (408) 764-5000
Fax: (408) 764-5032

3rd Planet Software
9911 W. Pico Blvd, Suite 1001
Los Angeles, CA 90034
(310) 553-2808
Fax: (310) 553-1830

**A**

a la mode Inc.
1015 Waterwood Parkway, Bldg F
Edmond, OK 73034
(800) ALAMODE or (405) 359-3346
Fax: (405) 359-8612

Abelson Communications Inc.
1685 Grand Ave.
Baldwin, NY 11510
(516) 546-2286
Fax: (516) 546-2271

Accton Technology Corp.
1962 Zanker Road
San Jose, CA 95112
(800) 926-9288 or (408) 452-8900
Fax: (408) 452-8988

Accu-Tech Corp.
200 Hembree Park Drive
Roswell, GA 30076-3890
(404) 751-9473
Fax: (404) 475-4659

Acculogic Inc.
13715 Alton Parkway
Irvine. CA 92716
(714) 454-2441 or (800) 234-7811
Fax: (714) 454-8527

Ace/North Hills
7934 Nieman Road
Lenexa, KS 66214
(800) 998-4223 or (913) 888-4999
Fax: (913) 888-4103

ACS Telecom
25825 Eshelman Ave.
Lomita, CA 90717
(310) 325-3055 or (800) 325-0425
Fax: (310) 325-3059

ADC Kentrox
14375 NW Science Park Drive
Portland, OR 97229

(800) 733-5511 or (503) 643-1681
Fax: (503) 641-3341

Addtron Technology Co. Ltd.
47968 Fremont Blvd.
Fremont, CA 94538
(800) 998-4638 or (510) 770-0120

Adaptec
691 S. Milpitas Blvd.
Milpitas, CA 95035
(800) 934-2766
Fax: (408) 957-7150

ADTRAN Inc.
901 Explorer Blvd.
Huntsville, AL 35806
(800) 827-0807 or (205) 971-8000
Fax: (205) 971-8699

Advanced Computer Communications (ACC)
10261 Bubb Road
Cupertino, CA 95014
(800) 444-7854 or (408) 366-9654

Advanced Digital Information Corp. (ADIC)
14737 NE 87th St, PO Box 97057
Redmond, WA 98073-9757
(800) 336-1233 or (206) 881-8004
Fax: (206) 881-2296

Advanced Information Managememt
12940 Harbor Drive
Woodbridge, VA 22192-2921
(703) 643-1002
Fax: (703) 643-2722

Advanced Logic Research Inc.
9401 Geronimo
Irvine, CA 92718
(800) 444-4ALR or (714) 581-6770
Fax: (714) 581-9240

Advanced Network Systems Inc.
16257 Monterey Road
Morgan Hill, CA 95037

(408) 779-2209 or (800) 333-6381
Fax: (408) 776-8511

Advanced Relay Communications Inc.
1896 Columbia St.
Eugene, OR 97403
(503) 345-9178
Fax: (503) 484-0216

AGE Logic Inc.
9985 Pacific Heights Blvd.
San Diego, CA 92121-4337
(619) 455-8600
Fax: (619) 597-6030

ALANTEC Corp.
70 Plumeria Drive
San Jose, CA 95134
(408) 955-9000 or (800) ALANTEC
Fax: (408) 955-9500

Alcom Corp.
1616 N. Shoreline Blvd.
Mountain View, CA 94043
(415) 694-7000
Fax: (415) 694-7070

Aleph Takoma Systems Inc.
7319 Willow Ave.
Takoma Park, MD 20912
(800) 368-5207 or (813) 261-6678
Fax: (813) 261-6549

Alfa Inc.
325 E. North Ave.
Westfield, NJ 07090
(908) 789-2068
Fax: (908) 789-2403

Alisa Systems Inc.
221 E. Walnut St, Suite 175
Pasadena, CA 91101
(800) 628-3274 or (818) 792-9474
Fax: (818) 792-9474

Allied Telesis Inc.

575 E. Middlefield Road
Mountain View, CA 94043
(800) 424-4284
Fax: (415) 964-8250

Alloy, A Div. of Impulse Technologies Inc.
25 Porter Road
Lttleton, MA 01460
(508) 486-0001
Fax: (508) 486-4108

Alphatronix Inc.
PO Box 13978
Research Triangle Park, NC 27709-3978
(800) 849-2611
Fax: (919) 544-4079

Alps Electric (USA) Inc.
3553 N. First St.
San Jose, CA 95134-1898
(800) 825-2577 or (408) 432-6000
Fax: (408) 432-6035

Alsys
10251 Vista Sorrento Parkway, Suite 300
San Diego, CA 92121
(619) 457-2700
Fax: (619) 452-1334

Alta Research Corp.
600 S. Federal Highway
Deerfield Beach, FL 33441
(800) 423-8535 or (305) 428-8535
Fax: (305) 428-8678

American Hytech Corp.
565 William Pitt Way
Pittsburgh, PA 15238
(412) 826-3333
Fax: (412) 826-3335

American Power Conversion
132 Fairgrounds Road
West Kingston, RI 02892
(800) 800-4APC

AMP
PO Box 3608
Harrisburg, PA 17105-3608
(800) 522-6752
Fax: (717) 986-7575

Andrew Corp.
10500 W. 153rd St.
Orland Park, IL 60462
(800) 328-2696
Fax: (800) 861-1700

Anixter Inc.
4711 Golf Road
Skokie, IL 60076
(708) 677-2600, ext. 2018
Fax: (708) 674-3045

Apertus Technologies Inc.
7275 Flying Cloud Drive
Eden Prairie, MN 55344
(800) 876-7671 or (612) 828-0300
Fax: (612) 828-0454

Apex PC Solutions Inc.
4580 150th Ave. NE
Redmond, WA 98052
(206) 861-5858
Fax: (206) 861-5757

Apsylog Inc.
1900 Emabarcadero Road, Suite 209
Palo Alto CA 94303
(800) APSYLOG or (415) 812-7700
Fax: (415) 812-7707

Arcada Software Inc.
37 Skyline Drive, Suite 1101
Lake Mary, FL 32646
(800) 3ARCADA
Fax: (407) 333-7770

Arco Computer Products Inc.
2750 N. 29th St, Suite 318
Hollywood, FL 33020
(800) 458-1666

Fax: (305) 925-2889

Armon Networking Inc.
314 E. Carrillo St., Suite 3
Santa Barbara, CA 93101
(800) 499-RMON or (805) 965-0859
Fax: (805) 965-5689

Arnet Corp.
618 Grassmore Park Drive, Suite 6
Nashville, TN 37211
(800) 366-8844 or (615) 834-8000
Fax: (615) 834-5399

Artisoft Inc.
2202 N. Forbes Blvd.
Tucson, AZ 85745
(800) 233-5564
Fax: (602) 670-7359

Asante Technologies Inc.
821 Fox Lane
San Jose, CA 95131
(800) 662-9686 or (408) 435-8388
Fax: (408) 432-7511

Ascend Communications Inc.
1275 Harbor Bay Parkway
Alameda, CA 94502
(800) 621-9578 or (510) 769-6001
Fax: (510) 814-2300

askSam Systems
119 S. Washington St. PO Box 1428
Perry, FL 32347
(904) 584-6590 or (800) 800-1997
Fax: (904) 584-7481

ASP Computer Products Inc.
160 San Gabriel Drive
Sunnyvale, CA 94086
(800) 445-6190 or (408) 746-2965
Fax: (408) 746-2803

AST Research Inc.
16215 Allon Parkway

Irvine, CA 92718
(800) 876-4278
Fax: (800) 926-1278

AT&T Advanced Technology Systems
PO Box 20046, Room C3D17
Greensboro, NC 27420
(800) 553-8805 or (910) 279-7829
Fax: (910) 279-6841

AT&T Global Information Solutions
1700 S. Patterson Blvd.
Dayton, OH 45729
(51 3) 445-5000

AT&T Secure Communications Systems
PO Box 20046
Greensboro, NC 27420
(800) 243-7883 or (910) 279-3411
Fax: (910) 279-5746

Attachmate Corp.
3617 131st Ave. SE
Bellevue, WA 98006
(800) 426-6283 or (206) 644-4010
Fax: (206) 747-9924

Avail Systems
4760 Walnut St.
Boulder, CO 80301
(303) 444-4018
Fax: (303) 546-4219

Avalan Technology Inc.
PO Box 6888, 116 Hopping Brook Park
Holliston, MA 01746
(800) 441-2281 or (508) 429-6482
Fax: (508) 429-3179

Axis Communications Inc.
99 Rosewood Drive, Suite 170
Danvers, MA 01923
(506) 777-7957
Fax: (508) 777-9905

AXON Networks Inc.

199 Wells Ave.
Newton, MA 02159
(800) 444-AXON or (617) 630-9600

Azure Technologies
63 South Street
Hopkinton, MA 01748-2212
(508) 435-3800, (800) 233-3800
Fax: (508) 435-0448

**B**

Banyan Systems Inc.
120 Flanders Road
Westboro, MA 01581-5013
(800) 2-BANYAN or (508) 898-1000
Fax: (508) 898-1755

Baranof Software Inc.
479 Washington St.
Brighton, MA 02135
(800) 462-4565 or (617) 783-0080
Fax: (617) 254-1412

Bay Networks, Inc.
4401 Great America Parkway, PO Box 58185
Santa Clara, CA 95052-8185
(800) PRO-NTWK
Fax: (408) 988-5525

Beame & Whiteside Software
706 Hillsborough St.
Raleigh, NC 27603-1655
(800) INFO-NFS
Fax: (919) 831-8990

Belden Wire & Cable Co.
PO Box 1980
Richmond, IN 47375
(800) BELDEN-4
Fax: (317) 983-5294

Belkin Components
1303 Walnut Park Way
Compton, CA 90220
(800) 223-5546 or (310) 898-1100
Fax: (310) 898-1111

Bendata Inc.
1755 Telstar Drive, Suite 100
Colorado Springs, CO 80920
(800) 778-7889 or (719) 531-5007
Fax: (719) 528-4230

Best Power Technology Inc.
PO Box 28O
Necedah, WI 54646

(800) 356-5794 or (608) 565-7200
Fax: (608) 565-2221

Bit Software Inc.
47987 Fremont Blvd.
Fremont, CA 94538
(510) 490-2928
Fax: (510) 490-9490

Blue Ocean Software Inc.
15310 Amberlv Drive, Suite 250
Tampa, FL 33647
(813) 977-4553
Fax: (813) 979-4447

BlueRithm Software
21823 N. Glen Drive
Colbert, WA 99005-9415
(509) 468-1434
Fax: (509) 467-2699

Boca Research Inc.
6413 Congress Ave.
Boca Raton, FL 33487
(407) 997-6227
Fax: (407) 997-0918

Brixton Systems Inc.
125 Cambridge Park Drive
Cambridge, MA 02140
(617) 661-6262
Fax: (617) 547-9820

Brooktrout Technology Inc.
144 Gould St.
Needham, MA 02194
(617) 449-4100
Fax: (800) 333-5274 or (617) 449-9009

Bus-Tech Inc.
129 Middlesex Turnpike
Burlington, MA 01803
(800) 284-3172 or (617) 272-8200
Fax: (617) 272-0342

BusLogic Inc.
4151 Bunton Drive
Santa Clara, CA 95054
(408) 492-9090
Fax: (408) 492-1542

BYTEX Corp.
4 Technologv Drive
Westborough, MA 01581-1760
(800) 227-1145 or (508) 366-8000
Fax: (508) 366-7970

**c**

Cable Management Systems Inc.
3510 S. Susan St.
Santa Ana, CA 92704
(714) 662-0554
Fax: (714) 662-1083

Cabletron Systems
35 Industrial Wav
Rochester, NH 03867
(603) 332-9400
Fax: (603) 337-2444

Calculus Inc.
1761 W. Hillsboro Blvd.
Deerfield Beach, FL 33442-1530
(305) 481-2334
Fax: (305) 481-1866

Cameo Communications Inc.
71 Spitbrook Road
Nashua, NH 03060
(800) 438-4827 or (603) 888-8869
Fax: (603) 888-8906

Campbell Services Inc.
21700 Northwestern Highway, 10th Floor
Southfield, MI 48075
(800) 345-8747 or (810) 559-5955
Fax: (810) 559-1034

Canary Communications Inc.
1851 Zanker Rood
San Jose, CA 95112-4213
(800) 883-9201 or (408) 453-9201
Fax: (408) 453-0940

Canoga Perkins Corp.
21012 Lassen St.
Chatswonth, CA 91311
(818) 718-6300
Fax: (818) 718-6312

Caravelle Networks Corp.
301 Moodie Drive, Suite 306
Nepean, ONT K2H 9C4 Canada

(800) 383-5292 or (813) 596-2802
Fax: (613) 596-9659

Cardiff Software Inc.
531 Stevens Ave, Building B
Solana Beach, CA 92075
(800) 659-8755 or (619) 259-6450
Fax: (619) 259-6435

Cascade Communications Corp.
5 Carlisle Road
Westford, MA 01886
(508) 692-2600, ext. 257
Fax: (508) 692-5052

Castelle Inc.
3255-3 Scott Blvd.
Santa Clara, CA 95054
(800) 289-7555 or (408) 496-0474
Fax: (408) 492-1964

Castle Rock Computing Inc,
20863 Stevens Creek Blvd, Suite 530
Cupertino, CA 95014
(408) 366-6540
Fax: (408) 252-2379

Cayman Systems Inc.
400 Unicorn Park Drive
Woburn, MA 01801
(800) 473-4778 or (817) 932-1100
Fax: (617) 932-3861

CE Software Inc.
1801 Industrial Circle,
PO Box 65580, West Des Moines, IA 50265
(800) 523-7638
Fax: (515) 221-1806

Chatsworth Products Inc.
9541 Mason Ave.
Chatsworth, CA 91311
(818) 882-8595
Fax: (818) 718-0473

Cheyenne Software Inc.

3 Expressway Plaza
Roslyn Heights, NY 11577
(800) 243-9462 or (516) 484 5110
Fax: (516) 484-3446

CHI/COR Information Management Inc.
300 S. Wacker Drive
Chicago, IL 60606
(312) 322-0150 or (800) 448-8777
Fax: (312) 322-0161

Chipcom Corp.
118 Turnpike Road
Southborough, MA 01772
(800) 228-9930 or (508) 460-8900
Fax: (508) 460-8950

Ciprico Inc.
2800 Campus Drive
Plymouth, MN 55441
(612) 551-4000 or (800) 727-4669
Fax: (612) 551-4002

Circuit Masters Software Inc.
10014 Kent Town Lane
Sugarland, TX 77478
(713) 242-9353
Fax: (713) 242-4632

Cisco Systems Inc.
930 E. Arquez Ave.
Sunnyvale, CA 94086
(800) 238-2334 or (408) 526-4000
Fax: (408) 526-8401

Citrix Systems Inc.
210 University Drive, Suite 700
Coral Springs, FL 33071
(800) 437-7503
Fax: (305) 341-8880

Clary Corp.
1960 S. Walker Ave.
Monrovia, CA 91016
(800) 442-5279
Fax: (818) 305-0254

CLEO Communications
3796 Plaza Drive
Ann Arbor, MI 48108
(800) 233-2536
Fax: (313) 682-1965

CNet Technology Corp.
2199 Zanker Road
San Jose, CA 95131
(408) 954-8000
Fax: (408) 954-8866

Codenoll Technology Corp.
1086 N. Broadway
Yonkers, NY 10701
(914) 965-6300
Fax: (914) 965-9811

Cogent Data Technologies
175 West St., PO Box 926
Friday Harbor, WA 98250
(800) 426-4368 or (208) 378-2929
Fax: (206) 378-2882

Collabra Software Inc.
1091 N. Shoreline Blvd.
Mountain View, CA 94043
(800) 474-7427
Fax: (415) 940-6440

Colorado Memory Systems
800 S. Past Ave.
Loveland, CO 80537
(800) 845-7905 or (303) 669-6500
Fax: (303) 667-0997

Command Software Systems
1061 E. Indiantown Road, Suite 500
Jupiter, FL 33477
(800) 423-9147 or (407) 575-3200
Fax: (407) 575-3026

CommVision Corp.
510 Logue Ave.
Mountain View, CA 94043

(800) TEAM LAN
Fax: (415) 254-9320

Compaq Computer Corp.
PO Box 692000
Houston, TX 77269-2000
(800) 345-1518

Compatible Systems Corp.
4730 Walnut St, Suite 102, PO Box 17220
Boulder, CO 80801
(303) 444-9532 or (800) 356-0283
Fax: (303) 444-9595

Compex Inc.
4051 E. La Palma
Anaheim, CA 92807
(800) 279-8891, pin# 1071 or (714) 830 7302
Fax: (714) 630-6521

CompLink Ltd.
175 Community Drive
Great Neck, NY 11021
(516) 829-1883, (212) 626-6731, or (708) 382-9191
Fax: (516) 829-5001 or (708) 382-9190

Compu-Link Cable Assemblies Inc.
13100 56th Court, Suite 705
Cleanwater, FL 34620
(800) 231-6685
Fax: (813) 573-5321

CompuLAN Technology Inc,
1630 Oakland Road, Suite A111
San Jose, CA 95131
(408) 432-8899
Fax: (408) 432-8699

Compulink Management Center
370 S. Crenshaw Blvd, Suite E-106
Torrance, CA 90503
(310) 212-5465
Fax: (310) 212-5217

CompuServe Network Services
5000 Arlington Centre Blvd.

Columbus, OH 43220
(800) 433-0389 or (614) 798-3354
Fax: (814) 791-9298

Computer Associates International Inc.
One Computer Associates Plaza
Islandia, NY 11788-7000
(800) CALL-CAI
Fax: (516) 342-5734

Computer Knacks Inc.
621 Shrewsbury Ave.
Shrewsbury, NJ 07702
(800) 551-1433 or (908) 530-0262
Fax: (908) 741-0972

Computer Law Systems Inc.
11000 W. 78th St.
Eden Prairie, MN 55344
(800) 328-1913, ext. 773
Fax: (612) 942-3450

Computer Library
One Park Ave.
New York, NY 10016
(800) 827-7889
Fax: (212) 503-4414

Computer Mail Services Inc.
20300 Civic Center Drive, Suite 300
Southfield, MI 48076
(810) 352-6700 or (800) 883-2674
Fax: (810) 352-8387

Computer Modules Inc.
2350 Walsh Ave.
Santa Clara, CA 95051
(408) 496-1881
Fax: (408) 496-1886

CompuTrend Systems Inc.
1306 John Reed Court
Industry, CA 91745
(800) 677-6477
Fax: (818) 369-6803

Concentric Data Systems Inc.
110 Turnpike Road
Westboro, MA 01581
(508) 366-1122 or (800) 325-9035
Fax: (508) 366-2954

Concord Communications Inc.
753 Forest St.
Marlboro, MA 01752
(508) 460-4643
Fax: (508) 481-9772

Conner Peripherals Inc.
3081 Zanker Road
San Jose, CA 95134
(800) 426-6637
Fax: (408) 456-4501

Conner Storage Systems
36 Skyline Drive
Lake Mary, FL 32746
(800) 5-CONNER
Fax: (407) 263-3555

Conner Tape Products Group
1640 Sunflower Ave.
Costa Mesa, CA 92626
(800) 6-Conner or (714) 641-1230
Fax: (714) 641-2590

Contemporary Cybernetics Group
Rock Landing Corporate Center. 346 Rock Landing
Newport News, VA 23606
(804) 873-9000
Fax: (804) 873-8836

Controlled Power Co.
1955 Stephenson Hwy
Troy, MI 48083
(800) 521-4792
Fax: (800) 642-9625

Copia International Ltd.
1342 Avalon Court
Wheaton, IL 60187
(708) 682-8898

Fax: (708) 665-9841

Cordant Inc.
11400 Commerce Park Drive
Reston, VA 22091
(800) 843-1132
Fax: (703) 758-7320

CORE International
7171 N. Federal Hwy
Boca Raton, FL 33487
(407) 997-6044
Fax: (407) 997-6009

Corel Corp.
1600 Carling Ave.
Ottawa, ONT KIZ 8R7 Canada
(800) 772-6735 or (613) 728-3733
Fax: (613) 761-9176

Cray Communications
9020 Junction Drive
Annapolis Junction, MD 20701
(800) FOR-CRAY or (301) 317-7710
Fax: (301) 317-7220

Cross International Corp.
854 Walnut St, Suite B
Boulder, CO 80302
(800) 288-2887 or (303) 440-7313
Fax: (303) 442-2616

Crystal Point Inc.
22232 17th Ave. SE, Suite 301
Bothell, WA 98021
(800) 982-0628 or (206) 487-3656
Fax: (206) 487-3773

CUBIX Corp.
2800 Lockheed Way
Carson City, NV 89706
(800) 829-0552
Fax: (702) 882-2407

Cylink Corp.
310 N. Mary Ave.

Sunnyvale, CA 94086
(800) 533-3958 or (408) 735-5800
Fax: (408) 735-6643

**D**

D & G Infosystems Inc.
148 Patterson Ave.
Long Island, NY 11550
(800) 430-4583 or (516) 538-1240
Fax: (516) 538-1240

D-Link Systems Inc.
5 Musick
Irvine, CA 92718
(800) 326-1688 or (714) 455-1688
Fax: (714) 455-2521

DANPEX Corp.
1342 Ridder Park Drive
San Jose, CA 95131
(800) 452-1551 or (408) 437-7557
Fax: (408) 437-7559

Data Access Corp.
14000 SW 119 Ave.
Miami, FL 33186-6017
(800) 451-3539 or (305) 238-0012
Fax: (305) 238-0017

Data General
4400 Computer Drive
Westboro, MA 01580
(800) 67-ARRAY
Fax: (508) 898-7501

Data Interface Corp.
11130 Jolleyville Road, Suite 300
Austin, TX 78759
(800) 351-4244 or (512) 346-5641
Fax: (512) 346-4035

Data Transmission Network
9110 W. Dodge Road, Suite 200
Omaha, NE 68114
(800) 369-2345
Fax: (402) 255-3688

Datacom Technologies
11001 31st Place West
Everett, WA 98204

(800) 468-5557 or (206) 355-0590
Fax: (206) 290-1600

Dataflex Corp.
3920 Park Ave.
Edison, NJ 08820
(800) 700-TRAIN
Fax: (908) 321-6590

DAVID Systems Inc.
615 Tasman Drive
Sunnyvale, CA 94088-3718
(800) 762-7848 or (408) 541-6000
Fax: (408) 541-8985

DaVinci Systems Corp.
4200 Six Forks Road
Raleigh, NC 27608
(919) 881-4320 or (800) 328-4624
Fax: (919) 787-3550

Dayna Communications Inc.
Sorenson Research Park, 849 W. Levoy Drive
Salt Lake City, UT 84123
(801) 269-7200
Fax: (801) 269-7363

DCA
1000 Alderman Drive
Alpharetta, GA 30202
(800) 348-3221
Fax: (404) 442-4366

Deltec Electronics Corp.
2727 Kurtz St.
San Diego, CA 92110
(800) 854-2658 or (619) 291-4211
Fax: (619) 291-2973

Denmac Systems Inc.
1945 Techny Road
Northbrook, IL 60062
(708) 291-7760
Fax: (708) 291-7763

Develcon

856 51st St. East
Saskatoon, SK S7K 5C7 Canada
(800) 667-9333 or (306) 933-3300
Fax: (306) 931-1370

Devont Software Inc.
1300 S. Frazier, Suite 111
Conroe, TX 77301
(409) 788-1881
Fax: (409) 788-2181

DFI
135 Main Ave.
Sacramento, CA 95838
(918) 568-1234
Fax: (916) 568-1233

DigiBoard
6400 Flying Cloud Dnve
Eden Prairie, MN 55344
(612) 943-9020 or (800) 344-4273
Fax: (612) 943-5398

Digicom Systems Inc.
188 Topaz St.
Milpitas, CA 95035
(408) 262-1277
Fax: (408) 262-1390

Digilog
900 Business Center Drive
Horsham, PA 19044
(800) DIGILOG
Fax: (215) 956-0108

Digital Communications Associates Inc. (DCA)
8230 Montgomery Road
Cincinnati, OH 45236
(513) 745-0500
Fax: (513) 745-0327

Digital Equipment Corp.
550 King St, LKGl -3/J17
Littleton, MA 01460
(800) DIGITAL or (508) 486-6963
Fax: (508) 486-6311

Digital Equipment Corp., OEM Storage Business
333 South St, SHRt-4/A16
Shrewsbury, MA 01545
(508) 841-6330
Fax: (508) 841-5078

Digital Pathways
201 Ravendale Drive
Mountain View, CA 94043
(415) 964-0707, ext. 621
Fax: (415) 961-7487

Digital Products
411 Waverley Oaks Road
Waltham, MA 02154
(800) 243-2333
Fax: (617) 647-4474

Distinct Corp.
12901 Saratoga Ave.
Saratoga, CA 95070
(408) 366-8933
Fax: (408) 366-0153

Diversified Computer Systems Inc.
3775 Iris Ave., Suite 1
Boulder, CO 80301
(303) 447-9251
Fax: (303) 447-1406

**E**

E Ware
145 W. 28th St., 12th Floor
New York, NY 10001-6114
(800) 743-8645 or (212) 564-7781
Fax: (212) 564-7499

E-COMMS Inc.
5720 144th St. NW
Gig Harbor, WA 98332
(206) 857-3399 or (800) 247-1431
Fax: (206) 857-3444

Eagle Technology, A Business Unit of Artisoft Inc.
2202 N. Forbes Blvd.
Tucson, AZ 85745
(800) 233-5564
Fax: (602) 670-7359

Eden Systems Corp.
9302 N. Meridian St. Suite 350
Indianapolis, IN 46260
(800) 779-6338
Fax: (317) 843-2271

EFI Electronics
2415 S. 2300 W,
Salt Lake City, UT 84119
(800) 877-1174
Fax: (801) 977-0200

Eicon Technology
2196 - 32nd Ave. (Lachine)
Montreal, QUE H8T 3H7 Canada
(800) 80-EICON
Fax: (214) 239-3304

ELAN Software Corp.
17383 Sunset Blvd, Suite 101
Pacific Palisades, CA 90272
(800) 654-3526
Fax: (310) 454-4848

EliaShim Microcomputers Inc.
4005 Wedgemere Drive
Tampa, FL 33610

(800) 477-5177
Fax: (813) 744-5197

Elisa Technology Inc.
4368 Enterprise St.
Fremont, CA 94538
(510) 651-5817
Fax: (510) 651-4834

Emerald Systems Corp.
15175 Innovation Drive
San Diego, CA 92128
(800) 787-2587 or (619) 673-2161
Fax: (619) 673-2288

EMPACT Software, A Division of Boole & Babbage
2375 Wall St.
Conyers, GA 30208
(404) 483-8852
Fax: (404) 388-9453

Emprise Technologies
South Pittsburgh Technology Park, 3117 Washington Pike
Bridgeville, PA 15017-1496
(800) 727-9060 or (41 2) 257-9060
Fax: (412) 257-9012

Emulex Corp.
3545 Harbor Blvd.
Costa Mesa, CA 92628
(800) 854-7112 or (714) 662-5600
Fax: (714) 513-8266

Enable Software Inc.
313 Ushers Road
Ballston Lake, NY 12019-1591
(800) 888-0684
Fax: (518) 877-3337

Epilogue Technology Corp.
11116 Desen Classic Lane
Albuquerque, NM 87111
(505) 271-9933
Fax: (505) 271-9798

EPSON

20770 Madrona Ave.
Torrance, CA 90503
(800) 289-3776
Fax: (310) 782-4248

Exabyte Corp.
1685 38th St.
Boulder, CO 80301
(800) EXATAPE
Fax: (303) 447-7170

Express Systems
2101 4th Ave, Suite 303
Seattle, WA 98121-2314
(206) 728-8300
Fax: (206) 728-8301

Extended Systems Inc.
7 E. Beall
Bozeman, MT 59715
(800) 235-7576 or (208) 322-7575
Fax: (208) 377-1906

**F**

Farallon Computing Inc.
2470 Mariner Square Loop
Alameda, CA 94501-1010
(510) 814-5000
Fax: (510) 814-5023

FiberCom Inc.
3353 Orange Ave, NE
Roanoke, VA 24012
(800) 537-6801
Fax: (703) 342-5961

Fibermux Corp.
21415 Plummer St.
Chatsworth, CA 91311
(800) 800-4624
Fax: (818) 709-1556

Fibronics International Inc.
33 Riverside Drive
Pembroke, MA 02359
(617) 826-0099
Fax: (617) 826-7745

FireFox Inc.
2841 Junction Ave., Suite 103
San Jose, CA 95134
(408) 321-8344 or (800) 230-6090
Fax: (408) 321-8311

First Floor Inc.
444 Castro St, Suite 200
Mountain View, CA 94041
(415) 968-1101
Fax: (415) 968-1193

Fluke Corp.
P0 Box 9090
Everett, WA 98206
(800) 44-FLUKE
Fax: (206) 356-5116

Fotec Inc.
529 Main St, PO Box 246
Boston, MA 02129

(800) 537-8254 or (617) 241-7810
Fax: (617) 241-8616

Frontier Software Development Inc.
1501 Main St.
Tewksbury, MA 01876
(508) 851-5700 or (800) 357-RMON
Fax: (508) 851-6956

Frontier Technologies Corp.
10201 N. Port Washington Road
Mequon, WI 53092
(414) 241-4555
Fax: (414) 241-7084

Frye Computer Systems Inc.
19 Temple Place
Boston, MA 02111
(617) 451-5400
Fax: (617) 451-6711

FTP Software Inc.
2 High St.
North Andover, MA 01645
(800) 282-4FTP or (508) 685-3300
Fax: (508) 794 4477

Fujitsu Computer Products of America Inc.
2904 Orchard Parkway
San Jose, CA 95134
(408) 432-6333
Fax: (408) 894-1709

Funk Software Inc.
222 Third St.
Cambridge, MA 02142
(800) 828-4146 or (617) 497-6339
Fax: (617) 547-1031

Future Domain Corp.
2801 McGaw Ave.
Irvine. CA 92714
(714) 253-0400
Fax: (714) 253-0913

Futurus Corp.

211 Perimeter Center Parkway. NE, Suite 910
Atlanta, GA 30346
(800) 327-8296
Fax: (404) 392-9313

**G**

Galacticomm Inc.
4101 SW. 47th Ave., Suite 101
Fort Lauderdale, FL 33314
(800) 328-1128 or (305) 321-2404
Fax: (305) 583-7846

Galaxy Networks Inc.
9348 De Soto Ave.
Chatsworth, CA 91311
(818) 998-7851
Fax: (818) 998-1758

Gandalf Technologies Inc.
Cherry Hill Industrial Center - 9
Cherry Hil1, NJ 08003-1688
(800) GANDALF
Fax: (613) 226-1717

General DataComm Inc.
1579 Straits Turnpike
Middlebury, CT 06762-1299
(203) 574-1118
Fax: (203) 758-9468

General Technology Inc.
415 Pineda Court
Melbourne, FL 32940
(800) 274-2733 or (407) 242-2733
Fax: (407) 254-1407

Glenco Engineering Inc.
270 Lexington Drive
Buffalo Grove, IL 60089
(800) 562-2543 or (708) 808-0300
Fax: (708) 808-0313

Grand Junction Networks Inc.
47281 Bayside Parkway
Fremont, CA 94538
(510) 252-0726
Fax: (510) 252-0915

Great Plains Software
1701 38th St. Southwest
Fargo, ND 58103

(800) 456-0025
Fax: (701) 281-3700

Gupta Corp.
1060 Marsh Road
Menlo Park, CA 94025
(800) 876-3267 or (415) 321-9500
Fax: (415) 321-5471

GVC Technologies Inc.
376 Lafayette Road
Sparta, NJ 07871
(201) 579-3630
Fax: (201) 579-2702

**H**

H T I Networks
532 Weddell Drive, Suite 1
Sunnyvale, CA 94089
(408) 745-0100
Fax: (408) 745-7711

Hadax Electronics Inc.
310 Phillips Ave.
South Hackensack, NJ 07606
(201) 807-1155
Fax: (201) 807-1782

Hammersly Technology Partners Inc.
909 Montgomery St., Suite 202
San Francisco, CA 94133
(800) 786-4778
Fax: (617) 575-0666

Handley Computer Corp.
P0 Box 3039
Boulder, CO 80307-3039
(303) 494-6035
Fax: (303) 494-1050

Hauppauge Computer Works
91 Cabot Court
Hauppauge, NY 11788
(516) 434-1600
Fax: (516) 434-3198

HawkNet Inc.
5950 La Place Court, Building 101
Carlsbad, CA 92008
(800) 729-5638 or (619) 929-9966
Fax: (619) 929-9969

Hayes Microcomputer Products Inc.
5835 Peachtree Corners East
Norcross, GA 30092
(404) 441-1617
Fax: (404) 449-0087

Helix Software Co.
47-09 30th St. - Third Floor
Long Island City, NY 11101

(800) 451-0551 or (718) 392-3100
Fax: (718) 392-4212

Help Desk Technology Corp.
835 Silver Birch Trail
Mississauga, ONT L5J 4C8   Canada
(800) 563-4357 or (905) 855-0000
Fax: (905) 823-7156

Hewlett-Packard Co, Network Test Div.
1 Tara Blvd.
Nashua, NH 03062
(603) 888-7000
Fax: (603) 888-7700

Hewlett-Packard Co.
3000 Hanover St.
Palo Alto, CA 94303-0890
(800) 826-4111
Fax: (800) 333-1917

Hewlett-Packard Co.
5070 Centennial Blvd.
Colorado Springs, CO 80919
(800) 452-4844
Fax: (719) 531-4526

Hewlett-Packard Co., Roseville Networks Div.
8000 Foolhills Blvd.
Roseville, CA 95747
(800) 533-1333
Fax: (800) 333-1917

HICOMP AMERICA
P0 Box 22758
Houston, TX 77227-2758
(800) 232-8863
Fax: (713) 626-3654

Hilgraeve Inc.
111 Conant Ave., Suite A
Monroe, MI 68121
(313) 243-0576
Fax: (313) 243-0645

HiTecSoft Corp.

3370 N. Hayden Road, Suite 123-175
Scottsdale, AZ 85251
(602) 970-1025
Fax: (602) 970-6323

Horizons Technology Inc.
3990 Ruffin Road
San Diego, CA 92123
(800) 28-3808
Fax: (619) 565-1175

Hubbell Premise Wiring Inc.
14 Lord's Hill Road, PO Box 901
Stonington, CT 06378-0901
(800) 626-0005 or (203) 535-8326
Fax: (203) 535-8328

Hummingbird Communications Ltd.
2900 John St.
Markham, ONT L3R 5G3   Canada
(905) 470-1203
Fax: (905) 470-1207

**I**

IBM Corp.
PO Box 12195, Department CO9/B060
Research Triangle Park, NC 27709
(800) IBM-CALL or (800) IBM-CARY
Fax: (800) 2-IBMor (800) IBM-4

IBM Corp.
Old Orchard Road
Armonk, NY 10504
(800) IBM-CALL or (800) IBM-CARY
Fax: (800) 2-IBMor (800) IBM-4

IBM Corp., DatagLANce Network Analyzer Development
Dept E67, Bld. 660, PO Box 12195
Research Triangle Park, NC 27709
(919) 254-1364
Fax: (800) IBM-4

IBM Personal Computer Co.
Route 100
Somers, NY 10589
(914) 766-1900
Fax: (914) 766-0116

IBM, Software Solutions Div.
Route 100, Bldg 1, M.D. 1335
Somers, NY 10589
(8OO) IBM-CALL or (800) IBM-CARY
Fax: (800) 2-IBMor (800) IBM-4

ICOT Corp.
3801 Zanker Road
San Jose, CA 95134
(800) SNA-3270 or (408) 432-3138
Fax: (408) 433-9466

IDEA
29 Dunham Road
Billerica, MA 01821
(800) 251-5027 or (508) 663-6878
Fax: (508) 663-8851

IMC Networks
16931 Millikan Ave.
Irvine. CA 92714

(714) 724-1070
Fax: (714) 724-1020

Infinite Technologies
11433 Cronridge Drive
Owings Mills, MD 21117
(800) 678-1097 or (410) 363-1097
Fax: (410) 363-0846

Information Builders Inc.
1250 Broadway
New York, NY 10001
(800) 969-INFO or (212) 736-4433
Fax: (212) 629-8819

Informer Data Security
12833 Monarch St.
Garden Grove, CA 92641
(800) 860-INFO or (714) 379-4480
Fax: (714) 379-4490

Informix Software Inc.
4100 Bohannon Dnve
Menlo Park, CA 94025
(800) 331-1763
Fax: (415) 926-6593

InfraLAN Wireless Communications
360 Massachusetts Ave.
Acton, MA 01720
(800) 266-1505 or (508) 266-1500
Fax: (508) 635-0806

Intel Corp.
5200 NE Elam Young Parkway
Hillsboro, OR 97124
(800) 538-3373
Fax: (800) 525-3019

Intellicom Inc.
20415 Nordhoff St.
Chatsworth, CA 91311
(818) 407-3900
Fax: (818) 882-2404

IntelliPower Inc.

10-A Thomas St.
Irvine. CA 92718
(714) 587-0155
Fax: (714) 587-0230

Intellisoft Inc.
2114 W. Mayfield Road
Arlington, TX 76015-2841
(800) 933-4889
Fax: (817) 467-7133

InterConnections Inc.
14711 NE 29th Place
Bellevue, WA 98007
(800) 950-5773 or (206) 881-4023
Fax: (206) 867-5022

Interphase Corp.
13800 Senlac
Dallas, TX 75234-8823
(800) FASTNET or (214) 919-9111

INTERSOLV
1700 NW 167th Place
Beaverton, OR 97006
(800) 547-7827
Fax: (503) 645-4576

INTRAK Inc.
9999 Business Park Ave., Suite B
San Diego, CA 92131
(800) 233-7494
Fax: (619) 271-4989

Iomega Corp.
1821 W. 4000 S.
Roy, UT 84067
(800) 777-6654 or (801) 778-3460
Fax: (801) 778-5763

Ipswitch Inc.
669 Main street
Wakefield, MA 01880
(617) 246-1150
Fax: (617) 245-2975

IQ Technologies
13625 NE 126th Place, Suite 400
Kirkland, WA 98034
(800) 227-2817
Fax: (206) 821-3961

ISICAD Inc.
1920 W. Corporate Way
Anaheim, CA 92803
(714) 533-8910 or (800) 634-1223
Fax: (714) 533-8642

**J**

J&L Information Systems
9600 Topanga Canyon Blvd.
Chatsworth, CA 91311
(818) 709-1778
Fax: (818) 882-9134

James River Group Inc.
125 N. First St.
Minneapolis, MN 55401
(612) 339-2521

JetFax
1376 Willow Road
Menlo Park, CA 94025
(800) 753-8329 or (415) 324-0600
Fax: (415) 326-6003

**K**

Kalpana Inc.
1154 E. Arques Ave.
Sunnyvale, CA 94086-4602
(800) 488-0775 or (408) 749-1600
Fax: (408) 749-1690

Katron Technologies Inc.
7400 Harwin Drive, Suite 120
Houston, TX 77036
(713) 266-3891
Fax: (713) 266-3893

Keyfile Corp.
22 Cotton Road
Nashua, NH 03063
(603) 883-3800 or (800) 4-KEYFILE
Fax: (603) 889-9259

KeyLogic Inc.
Independence Place, PO Box 278
Goffstown, NH 03045
(603) 472-4006
Fax: (603) 497-3785

Kingston Technology Corp.
17600 Newhope St.
Fountain Valley, CA 92708
(800) 435-2620 or (714) 435-2600
Fax: (714) 435-2699

Klever Computers Inc.
1028 W. Maude Ave.
Sunnyvale, CA 94086
(800) 745-4660
Fax: (408) 735-7723

Klos Technologies Inc.
604 Daniel Webster Highway
Merrimack, NH 03054
(603) 424-8300
Fax: (603) 424-9300

KnowledgeWare Inc.
3340 Peachtree Road, NE
Atlanta, GA 30326

(800) 444-8575
Fax: (404) 365-0246

Knozall Systems Inc., A Division of Tangram Enterprise Solutions, Inc.
375 E. Elliot Road, Suite 10
Chandler, AZ 85225-1130
(800) 333-8698 or (602) 545-0006
Fax: (602) 545-0008

KoFAX Image Products
3 Jenner St.
Irvine. CA 92718-3807
(714) 727-1733
Fax: (714) 727-3144

**L**

LAN Performance Labs
4901 Morena Blvd., Suite 805
San Diego, CA 92117
(800) 726-8101 or (619) 273-1442
Fax: (619) 273-2706

LAN Scope Inc.
18 W. Langhorne Ave.
Havertown, PA 19083
(800) 879-5330 or (610) 359-3573
Fax: (610) 446-2663

LAN-ACES Inc.
12777 Jones Road, Suite 461
Houston, TX 77070
(800) LAN-ACES or (713) 890-9787
Fax: (713) 890-9731

LAN\mind
2000 N. RacInc. Suite 4600
Chicago, IL 60614
(800) 325-5267 or (312) 935-9900
Fax: (312) 935-0238

LANart Corp.
145 Rosemary St.
Needham, MA 02194
(800) 292-1994 or (617) 444-1994
Fax: (617) 444-3692

LANCAST
10 Northern Blvd Unit 5
Amherst, NH 03031
(800) 752-2768
Fax: (603) 881-9888

Landings Technology Corp.
Merrill Block, Unit A2, 163 Water St,
Exeter, NH 03833
(800) 222-3734 or (603) 772-4500
Fax: (603) 772-0141

LANNET Inc.
17942 Cowan Ave.
Irvine. CA 92714

(800) 522-6638
Fax: (714) 752-6641

LANovation
1313 Fifth St. SE
Minneapolis, MN 55414
(800) 747-4487 or (61 2) 379-3805
Fax: (612) 378-3818

LANQuest
2225 Qume Drive
San Jose, CA 95131
(800) 487-7779 or (408) 894-1000
Fax: (408) 894-1001

LANshark Systems Inc.
6502 E. Main St.
Reynoldsburg, OH 43068
(614) 866-5553
Fax: (614) 866-4877

LANSource Technologies Inc.
221 Dufferin St., Suite 310A
Toronlo, ONT M6K 3J2   Canada
(800) 677-2727 or (416) 535-3555
Fax: (416) 535-6225

Lantronix
15353 Barranca Parkway
Irvine. CA 92718
(800) 422-7055 or (714) 453-3990
Fax: (714) 453-3995

Lanworks Technologies Inc.
2425 Skymark Ave.
Mississauga, ONT L4W 4Y6 Canada
(800) 808-3000 or (905) 238-5528
Fax: (714) 367-0895 or (905) 238-9407

LeeMah DataCom Security Corp.
3948 Trust Way
Hayward, CA 94545
(510) 786-0790 or (800) 992-0020
Fax: (510) 786-1123

Legent Corp.

375 Herndon Parkway
Herndon, VA 22070
(800) 676-LGNT

Legato Systems Inc.
3145 Porter Drive
Palo Alto, CA 94304
(415) 812-6000
Fax: (415) 812-6032

Levi, Ray & Shoup Inc.
2401 W. Monroe St.
Springfield, IL 62704
(217) 793-3800
Fax: (217) 787-0979

Lexmark International Inc.
740 New Circle Road NW
Lexington, KY 40511
(800) 358-5835
Fax: (306) 232-2380

Liant Software Corp.
8911 Capital Of Texas Highway North
Austin, TX 78759
(512) 43-1010 or (800) 762-6265
Fax: (512) 343-9487

Liebert Corp.
1050 Dearborn Drive
Columbus, OH 43229-9479
(800) 877-9222
Fax: (614) 841-6973

Lightstream Corp.
1100 Technology Park Drive
Billerica, MA 01821
(508) 262-1000
Fax: (508) 262-1072

Linksys
1681IA Millikan Ave.
Irvine. CA 92714
(800) 546-5797
Fax: (714) 261-8868

Logicraft
22 Cotton Road
Nashua, NH 03063
(800) 880-5644 or (603) 880-0300
Fax: (603) 880-7229

Lotus Development Corp.
55 Cambridge Parkway
Cambridge, MA 02142
(800) 343-5414 or (617) 577-8500; Canada (800) 465-6887
Fax: (617) 253-9150

Luxcom Inc.
3249 Laurelview Court
Fremont, CA 94538
(800) 322-5000 or (510) 770-3300
Fax: (510) 770-3399

**M**

Macola Software
333 E. Center St.
Marion, OH 43302
(800) 468-0834 or (614) 382-5999,ext 650
Fax: (614) 382-0239

Madge Networks Inc.
2310 N. First St.
San Jose, CA 95131
(800) 876-2343 or (408) 955-0700
Fax: (408) 955-0970

Magic Software Enterprises
1200 Main St.
Irvine. CA 92714
(800) 345-6244
Fax: (714) 250-7404

MAGIC Solutions Inc.
180 Franklin Turnpike
Mahwah, NJ 07430
(201) 529-5533
Fax: (201) 529-2955

Make Systems Inc.
201 San Antonio Circle
Mountain View, CA 94040
(800) 545-MAKE or (415) 941-9800
Fax: (415) 941-5856

Mannesmann Tally Corp.
PO Box 97018
Kent, WA 98064-9718
(800) 843-1347 or (206) 251-5524
Fax: (206) 251-5520

Maxell Corp of America
22-08 Route 208
Fair Lawn, NJ 07410
(201) 794-5900
Fax: (201) 796-8790

McAfee
2710 Walsh Ave.
Santa Clara,CA 95051-0963

(408) 988-3832
Fax: (408) 970-9727

Media Integration Inc.
3949 Research Park Court, Suite 190
Soquel, CA 95073
(800) 824-7385 or (408) 475-9400
Fax: (408) 475-0110

Megaherz Corp., a division of U.S. Robotics
605 N. 5600 W., PO Box 16020
Salt Lake City, UT 84116
(800) LAPTOPS
Fax: (801) 320-6022

Memorex Telex
Texas Commerce Towver, 545 E. John Carpenter Freeway
Irving, TX 75062
(214) 444-3500
Fax: (214) 444-3501

Meridian Data Inc.
5615 Scotts Valley Drive
Scotts Valley, CA 95066
(800) 767-2537 or (408) 438-3100
Fax: (408) 438-6816

Meridian Technology Corp.
11 McBride Corporate Center Drive, Suite 250
Chesterfield, MO 63005-1406
(314) 532-7708
Fax: (314) 532-3242

MetaWare Inc.
2161 Delaware Ave
Santa Cruz, CA 95060-5706
(408) 429-6382
Fax: (408) 429-9273

METZ Software Inc.
PO Box 6699
Bellevue, WA 98008
(800) 447-1712 or (206) 641-4525
Fax: (206) 644-6026

MICOM Communications Corp.

4100 Los Angeles Ave.
Simi Vallev, CA 93063
(800) 642-6687 or (805) 583-8600
Fax: (805) 583-1997

Micro Computer Systems Inc.
2300 Valley View, Suite 800
Irving, TX 75062
(214) 659-1514
Fax: (214) 659-1624

Micro Design International Inc.
6985 University Blvd.
Winter Park, FL 32792
(800) 228-0891 or (407) 677-8333
Fax: (407) 677-8365

Micro-Integration Corp.
One Science Park
Frostburg, MD 21532
(800) 832-4526
Fax: (301) 689-0808

Microcom Inc.
500 River Ridge Drive
Norwood, MA 02062
(800) 822-8224
Fax: (617) 551-1021

Microdyne Corp.
3601 Eisenhower Ave.
Alexandria, VA 22304
(800) 255-3967
Fax: (703) 683-8924

MicroNet Technology Inc.
80 Technology
Irvine. CA 92718
(714) 453-6100
Fax: (714) 453-6101

Micropolis Corp.
21211 Nordhoff St.
Chatsworth, CA 91311
(800) 395-3748
Fax: (818) 718-5312

Microrim Inc.
15395 SE 30th Place
Bellevue, WA 98007
(800) 628-6990 or (206) 649-9500
Fax: (206) 649-2785

Microsoft Corp.
One Microsoft Way
Redmond, WA 98052-6399
(800) 227-4679

Microsystems Engineering Co.
2500 Highland Ave, Suite 350
Lombard, IL 60148
(800) SYS-DRAW
Fax: (708) 261-9520

Microtest Inc.
4747 N. 22nd St.
Phoenix, AZ 85016-4708
(800) 526-9675
Fax: (802) 952-6401

MiLAN Technology Corp.
894 Ross Drive, Suite t0t
Sunnyvale, CA 94089-1443
(800) G0-MiLAN or (408) 752-2770
Fax: (408) 752-2790

MINUTEMAN
1455 LeMay Drive
Carrollton, TX 75007
(800) 238-7272
Fax: (214) 446-9011

Mitron Computer Inc.
2220 S. Bascom Ave.
Campbell, CA 95008
(800) 713-6888 or (408) 371-8166

MOD-TAP
PD Box 706
Harvard, MA 01451
(508) 772-5630
Fax: (508) 772-2011

Mountain Network Solutions Inc.
360 El Pueblo Road
Scotts Valley, CA 95066
(800) 458-0300 or (408) 438-6650
Fax: (408) 461-3047

Multi-Tech Systems Inc.
2205 Woodale Drive
Mounds View, MN 55112
(612) 785-3500 or (800) 328-9717
Fax: (612) 785-9874

Multima Corp.
One Rosewood Court
East Greenwich, RI 02818-1543
(800) 532-4862 or (401) 885-1916
Fax: (401) 885-2605

Mustang Software Inc.
6200 Lake Ming Road
Bakersfield, CA 93306
(800) 999-9619 or (605) 873-2500
Fax: (805) 873-2599

**N**

National Computer Security Association
10 S. Courthouse Ave.
Carlisle, PA 17013
(717) 258-1816
Fax: (717) 243-8642

National Semiconductor Corp.
M/S D3-615, PO Box 58090, 2900 Semiconductor Drive
Santa Clara, CA 95052-8090
(800) 227-1817, ext. 100
Fax: (408) 721-7662

NEC America Inc, Data Communications Systems Div.
1525 W. Walnut Hill Lane
Irving, TX 75038-3797
(800) 222-4NEC or (214) 518-4480
Fax: (214) 518-5572

Neon Software
3685 Mt. Diablo Blvd, Suite 203
Lafayene, CA 94549
(510) 283-9771
Fax: (510) 283-6507

Net Manage
10725 North De Anza Blvd
Cupertino, CA 95014
(408) 973-7171
Fax: (408) 257-6405

NetFRAME Systems Inc.
1545 Barber Lane
Milpitas, CA 95035
(800) 852-3726 or (408) 944-0600
Fax: (800) 852-3726 or (408) 434-4190

NetLabs Inc.
4920 El Camino Real
Los Allos, CA 94022
(800) 525-4565
Fax: (415) 961-4300

NETLAN Inc.
29 W. 38th St.
NewYork, NY 10018

(212) 768-2273
Fax: (212) 768-2301

Netlink Inc.
3214 Sprint Forest Road
Raleigh, NC 27604
(919) 878-8612
Fax: (919) 872-2132

Netmagic Systems Inc.
2393 Maple Ave.
Peekskill, NY 10566
(914) 739-4579, ext 14
Fax: (914) 739-4616

NetManage Inc.
10725 N. De Anza Blvd
Cupertino, CA 95014
(408) 973-7171
Fax: (408) 257-6405

NetPlus Software Inc.
47 Wake Robin Road
Sudbury, MA 01776-1771
(508) 443-6043
Fax: (508) 443-0638

Netrix Corp.
13595 Dulles Technology Drive
Herndon, VA 22071
(703) 742-6000
Fax: (703) 742-4048

NetSoft
39 Argonaut
Laguna Hills, CA 92656
(800) 352-3270 or (714) 768-4013
Fax: (714) 768-5049

Network Application Technology Inc.
16886 Dell Ave.
Campbell, CA 95008
(800) 474-7888 or (408) 370- 4300
Fax: (408) 776-8448

Network Computing Devices Inc, PC-X Div

9590 SW Gemini Drive
Beaverton, OR 97005
(503) 671-2200
Fax: (503) 643-8642

Network Computing Inc.
100 N. Winchester Blvd. #262
Santa Clara, CA 95050-6566
(800) 736-3012 or (408) 296-8080
Fax: (408) 296-8329

Network Equipment Technologies Inc (NET)
800 Saginaw Drive
Redwood City, CA 94063-4740
(415) 366-4400
Fax: (415) 780-5160

Network General Corp.
4200 Bohannon St.
Menlo Park, CA 94025
(415) 473-2000

Network Peripherals Inc.
1371 McCarthy Blvd.
Milpitas, CA 95035
(800) NPI-8855
Fax: (408) 321-9218

Network Products Corp.
1440 W. Colorado Blvd.
Pasadena, CA 91105
(800) 838-7785 or (818) 441-6504
Fax: (818) 441-6894

Network Systems Corp.
7600 Boone Ave. North
Minneapolis, MN 55428
(612) 424-4888
Fax: (612) 424-2853

Network Technologies Inc.
1275 Danner Drive
Aurora, OH 44202
(800) 742-8324 or (216) 562-7070
Fax: (216) 562-1999

Networks Northwest Inc.
3633 138th Pl. SE., Suite 100
Bellevue, WA 98006
(800) 835-9462 or (206) 641-8779
Fax: (206) 641-8909

NetWorth
8404 Esters Blvd.
Irving, TX 75063
(800) 544-5255 or (2t4) 929-1700
Fax: (214) 929-1720

Newbridge Networks Inc.
594 Herndon Parkway
Herndon, VA 22070
(800) DO-VIVID or (703) 834-3600
Fax: (703) 708-5959

Newport Systems Solutions Inc., (Cisco)
4019 Westerly Place
Newport Beach, CA 92660
(714) 752-1511 or (800) 368-6533
Fax: (714) 752-8389

NHC Communications
5450 Cote de Liesse
Mount Royal, QUE H4P IA5   Canada
(800) 361-1965 or (514) 735-2741
Fax: (514) 735-8057

Niwot Networks Inc.
2200 Central Ave, Suite B
Boulder, CO 80301
(303) 444-7785
Fax: (303) 444-7767

Nonstop Networks Ltd.
20 Waterside
New York, NY 10010
(212) 481-8488
Fax: (212) 779-2956

Northern Telecom Inc.
6201 W. Oakton St.
Morton Grove, IL 60053-2756
(800) 262-9334

Fax: (800) 262-9334

NovaStor Corp.
30961 Agoura Road, Suite 109
Westlake Village, CA 91361
(818) 707-9900
Fax: (818) 707-9902

Novell Inc.
122 E. 1700 S
Provo, UT 84606
(800) NETWARE or (801) 429-5588

Novell Inc.
1340 Treat Blvd. Suite 300
Walnut Creek, CA 94596
(800) NETWARE

Novell Inc.
2180 Fortune Drive
San Jose, CA 95131
(800) NETWARE
Fax: (801) 429-2700 or (408) 577-5668

NU-Mega Technologies Inc.
PO Box 7780
Nashua, NH 03060
(603) 889-2386
Fax: (603) 889-1135

**O**

OAZ Communications
44920 Osgood Road
Fremont, CA 94539
(800) 638-3293 or (510) 226-0171
Fax: (510) 226-7079

Ocean Isle Software
1201 19th Place
Vero Beach, FL 32960
(800) 677-6232 or (407) 770-4777
Fax: (407) 770-4779

Olicom USA Inc.
900 W. Park Blvd, Suite 180
Plano, TX 75074
(800) 2-OLICOM
Fax: (214) 423-7261

On Demand Software & Services Inc.
1100 Fifth Ave. South, Suite 208
Naples, FL 33940
(800) 368-5207 or (813) 261-6678
Fax: (813) 261-6549

ON Technology Corp.
One Cambridge Center, Sixth Floor
Cambridge, MA 02142
(617) 374-1400
Fax: (617) 374-1433

Ontrack Computer Systems
6321 Bury Drive
Eden Prairie, MN 55346
(612) 937-1107 or (800) 752-1333
Fax: (812) 937-5815

Optus Software
100 Davidson Ave.
Somerset, NJ 08873
(908) 271-9568
Fax: (908) 271-9572

Ornetix Network Products
1249 Innsbruck Drive
Sunnyvale, CA 94089

(800) 965-6650 or (408) 744-9095
Fax: (408) 744-1068

OSIware
#210 - 4400 Dominion St.
Burnaby, BC V5G 4G3 Canada
(604) 436-2922

**P**

Pacific Data Products
9125 Rehco Road
San Diego, CA 92121
(619) 525-3663
Fax: (619) 552-0889

Palindrome Corp.
600 E. Diehl Road
Naperville, IL 60563
(708) 505-3300
Fax: (708) 505-7917

PaperClip Imaging Software Inc.
Continental Plaza One. 401 Hackensack Ave,
Hackensack, NJ 07601
(800) 929-3503 or (201) 487-3503
Fax: (201) 487-3503

Passport Communications Inc.
1101 S. Capital of Texas Hwy, Suite 250-F
Austin, TX 78746
(512) 328-9830
Fax: (512) 328-3847

PC DOCS Inc.
124 Marriott Drive
Tallahassee, FL 32301
(904) 942-3627
Fax: (904) 656-5559

Penril Datability Networks
Corporate Headquarters, 1300 Quince Orchard Blvd.
Gaithersburg, MD 20878
(800) 4-PENRIL or (301) 921-8600
Fax: (301) 921-8376

Perceptive Solutions Inc.
2700 Flora St.
Dallas, TX 75201
(214) 954-1774 or (800) 486-3278
Fax: (214) 953-1774

Peregrine Systems Inc.
1959 Palomar Oaks Way
Carlsbad, CA 92009

(619) 431-2400
Fax: (619) 431-0696

Pinnacle Micro
19 Technology
Irvine. CA 92718
(800) 553-7070 or (714) 727-3300
Fax: (714) 727-1913

Plaintree Systems
70 Walnut St.
Wellesley, MA 02181
(800) 370-2724
Fax: (617) 239-7570

Plexcom Inc.
2255 Agate Court
Simi Valley, CA 93065
(805) 522-3333
Fax: (805) 583-4764

Plustek USA Inc.
1362 Bordeau Drive
Sunnyvale, CA 94089
(408) 745-7111
Fax: (408) 745-7562

Portfolio Technologies Inc.
5600 Mowry School Road, Suite 100
Newark, CA 94560
(510) 226-5600
Fax: (510) 226-8182

Powersoft Corp.
561 Virginia Road
Concord, MA 01742
(800) 395-3525 or (508) 287-1500
Fax: (508) 369-5071

Preferred Systems Inc.
250 Caplain Thomas Blvd.
West Haven, CT 06516
(203) 937-3000 or (800) 222-7638
Fax: (203) 937-3032

Primavera Systems Inc.

Two Bala Plaza
Bala Cynwyd, PA 19004
(800) 423-0245 or (610) 667-8600
Fax: (610) 667-7894

Primax Electronics
254 E. Hacienda Ave.
Campbell, CA 95008
(800) PRIMAX-1
Fax: (408) 370-2009

Printronix
17500 Cartwright Road
Irvine. CA 92713
(800) 826-3874
Fax: (714) 660-8682

Procom Technology Inc.
2181 Dupont Drive
Irvine, CA 92715
(800) 800-8600 or (714) 852-1000
Fax: (714) 852-1221

Procomp USA Inc.
6777 Engle Road, Suite L
Cleveland, OH 44130
(216) 234-6387
Fax: (216) 234-2233

Progress Software Corp.
14 Oak Park
Bedford, MA 01730
(617) 280-4700
Fax: (617) 280-4095

Protec Microsystems Inc.
297 Labrosse
Pointe-Claire, QC H9R 1A3   Canada
(800) 363-8156
Fax: (514) 694-6973

Proteon Inc.
9 Technology Drive
Westborough, MA 01581
(415) 960-1630
Fax: (415) 964-5181

**Q**

QMS Inc.
One Magnum Pass, PO Box 81205
Mobile, AL 36689-1250
(205) 633-4300 or (800) 523-2696
Fax: (205) 636-0013

Qstar Technologies Inc.
600 E Jefferson St.
Rockville, MD 20852
(800) 568-2578 or (301) 762-9800
Fax: (301) 762-9800

Qualitas Inc.
7101 Wisconsin Ave., Suite 1024
Bethesda, MD 20814
(800) 733-1377
Fax: (301) 718-6060

Quarterdeck Office Systems
150 Pico Blvd.
Santa Monica, CA 90405
(310) 392-9851
Fax: (310) 314-3219

Quyen Systems Inc.
1300 Piccard Drive, Suite 108
Rockville, MD 20850 4303
(800) 827-1856
Fax: (301) 258-5088

**R**

Racal InterLan Inc.
155 Swanson Road
Boxborough, MA 01719
(800) LAN-TALK
Fax: (508) 263-8655

Racore Computer Products Inc.
170 Knowles Drive, Suite 204
Los Gatos, CA 95030
(800) 635-1274 or (408) 374-8290
Fax: (408) 374-8290

RAD Data Communications
900 Corporate Drive
Mahwah, NJ 07430
(201) 529-1100
Fax: (201) 529-5777

Rad Network Devices Inc. (RND)
3505 Cadillac Ave. Suite G5
Costa Mesa, CA 92626
(714) 436-9700
Fax: (714) 436-1941

Raima Corp.
1605 NW Sammamish Road, Suite 200
Issaouah, WA 98027
(800) dbRaima or (208) 557-0200
Fax: (206) 557-5200

Reach Software Corp.
872 Hermosa Drive
Sunnyvale, CA 94040
(408) 733-8685
Fax: (408) 733-9265

Reflex Inc.
2100   196th St. SW. Suite 124A
Lynnwood, WA 98036
(800) 673-3539 or (206) 776-2524
Fax: (313) 741-9528

Relay Technology Inc.
1106 Spring Hill Road
Vienna, VA 22182-7409

(800) 795-8674 or (703) 506-0500
Fax: (703) 506-0510

Relevant Business Systems
3130 Crow Canyon Place, Suite 300
San Ramon, CA 94583
(510) 867-3830
Fax: (510) 867-3840

Relia Technologies Inc.
761 University Ave, Suite B
Los Gatos, CA 95030
(408) 399-4350
Fax: (408) 354-2545

Relisys
320 S. Milpitas Blvd.
Milpitas, CA 35131
(408) 945-9000
Fax: (408) 945-0587

Remedy Corp.
1965 Landings Drive
Mountain View, CA 94043
(415) 903-5200
Fax: (415) 903-9001

Rememory Corp.
3186 Airway Ave, Building E
Cosla Mesa, CA 92626
(800) 644-2300 or (414) 708-0990
Fax: (714) 708-0993

Renex Corp.
Lakepoint 1, 2750 Killarney Drive
Woodbrldge, VA 22192
(703) 878-2400
Fax: (703) 878-4625

Retix
2401 Colorado Ave.
Santa Monica, CA 90404-3563
(800) 255-2333 or (310) 828-3400
Fax: (310) 828-2255

Revelation Technologies Inc.

181 Harbor Drive
Stamford, CT 06902
(800) 262-4747 or (203) 973-1000
Fax: (203) 975-8755

Rexon Software
2750 N. Clovis Ave.
Fresno, CA 93727
(800) 228-9236
Fax: (209) 292-8908

Rhetorex Inc.
200 E. Hacienda Ave.
Campbell, CA 95008
(408) 370-0881, ext. 1
Fax: (408) 370-1171

RightFax
4400 E. Broadway, Suite 312
Tucson, AZ 85711
(602) 327-1357
Fax: (602) 321-7456

Rimage Corp.
7725 Washington Ave. South
Minneapolis, MN 55439
(800) 445-8288
Fax: (612) 944-7808

Rockwell Network Systems
7402 Hollister Ave.
Santa Barbara, CA 93117
(800) 262-8023
Fax: (805) 968-6478

Rose Electronics
10850 Wilcrest, 900
Houston, TX 77092
(800) 333-9343 or (713) 933-7673
Fax: (713) 933-0044

Rosetta Technologies
9417 Princess Palm Ave.
Tampa, FL 33619
(800) 937-4224 or (813) 623-6205
Fax: (813) 620-1107

RoseWare
P.O. Box 8564
Asheville, NC 28814-8564
(800) 767-3887 or (704) 258-9166
Fax: (704) 258-9374

RSA Data Security Inc.
100 Marine Parkway, Suite 500
Redwood City, CA 94065
(415) 595-8782
Fax: (415) 595-1873

Rupp Technology Corp.
3228 E. Indian School Road
Phoenix, AZ 85018
(602) 224-9922

Russell Information Sciences
115 Columbia, Suite 100
Laguna Hills, CA 92656
(714) 362-4000
Fax: (714) 362-4040

**S**

Saber Software Corp., (McAfee)
5944 Luther Lane, Suite 1007
Dallas TX 75225
(800) 338-8754 or (214) 361-8086
Fax: (214) 361-1882

SABRE Training Systems & Solutions
PO Box 619285 -MD 4382
DFW Airport, TX 75261-9285
(800) 842-3693 or (817) 963-3526
Fax: (817) 963-3853

Safetynet Inc.
55 Bleeker St.
Millburn, NJ 07041-1414
(800) 851-0188 or (201) 467-1024
Fax: (201) 467-1611

Sanyo Icon
18301 Von Karman, Seventh Floor
Irvine. CA 92715
(800) 487-2696 or (714) 263-3777
Fax: (714) 263-3758

Scope Communications Inc.
100 Otis St.
Northboro, MA 01532
(508) 393-1236
Fax: (508) 393-2213

Secure Design
PO Box 475
Corvallis, OR 97339
(503) 752-5988
Fax: (503) 752-5990 E-mail: Support@sdesign.com

Security Dynamics
One Alewife Center
Cambridge, MA 02140
(617) 547-7820
Fax: (617) 354-8836

SHIP STAR Associates Inc.
36 Woodhill Drive, Suite 19
Newark, DE 19711

(302) 738-7782
Fax: (302) 738-0855

Shiva Corp.
Northwest Park, 63 Third Ave.
Burlington, MA 01803
(800) 458-3550 or (508) 788-3061
Fax: (508) 788-1301

Siecor Corp.
PO Box 489
Hickory, NC 28603-0489
(704) 327-5000
Fax: (704) 327-5973

Siemens Nixdorf Printing Systems
5500 Broken Sound Blvd.
Boca Raton, FL 33487
(800) 523-5444; (407) 997-3126; or (407) 997-3128
Fax: (407) 997-9160

SilCom Manufacturing Technology Inc.
4854 Old National Highway, Suite 110
Atlanta, GA 30337
(800) 388-3807 or (404) 767-0706
Fax: (404) 767-0709

Silicom Connectivity Solutions Inc.
15311 NE 90th St.
Redmond, WA 98052
(800) 474-5426 or (206) 882-7995
Fax: (206) 882-4775

SimWare
32235 Industrial Road
Livonia, MI 48150
(313) 422-5470
Fax: (313) 422-5940

Simpact Inc.
9210 SkyPark Court
San Diego, CA 92123
(800) 746-7228 or (619) 565-1865
Fax: (619) 292-8015

Simware Inc.

2 Gurdwara Road
Ottawa, ONT K2E IA2   Canada
(613) 727-1779
Fax: (613) 727-3533

Sirius Systems Technology Inc. (SST)
4344 Young St.
Pasadena, TX 77504
(800) 424-0724 or (713) 946-0724
Fax: (713) 946-5451

Smith Micro Software Inc.
51 Columbia
Aliso Viejo, CA 92656
(800) 964-SMSI or (714) 362-2345

SofNet Inc.
1110 Nonhchase Parkway, Suite 150
Mariena, GA 30067
(800) FaxWORKS or (404) 984-8088
Fax: (404) 984-9956

SoftArc Inc.
100 Allstate Parkway
Markham, ONT L3R 6H3 Canada
(905) 415-7000 or (416) 609-2250
Fax: (905) 415-7151

Softbridge Inc.
125 Cambridge Park Drive
Cambridge, MA 02140
(800) 955-9190 or (817) 576-2257
Fax: (617) 864-7747

SoftKlone Distributing Corp.
327 Office Plaza Drive, Suite 100
Tallahassee, FL 32301
(800) 634-8670 or (904) 878-8564
Fax: (904) 877-9763

SoftSolutions Technology Corp. (Novell)
625 S. State St.
Orem, UT 84058
(801) 226-6000
Fax: (801) 224-0920

Software AG
11190 Sunrise Valley Drive
Reston, VA 22091
(800) 423-2227 or (703) 860-5050
Fax: (703) 391-8200

Software Artistry Inc.
9449 Priority Way W. Dr.
Indianapolis, IN 46240
(800) 795-1993 or   (317) 843-7477
Fax: (317) 574-5867

Solectek Corp.
6370 Nancy Ridge Drive, Suite 109
San Diego, CA 92121-3212
(800) 437-1518
Fax: (619) 457-2681

Solomon Software
1218 Commerce Pkwy, PO Box 414
Findlay, OH 45839
(800) 879-0444 or (419) 424-0422
Fax: (419) 424-3400

Spry Inc. (CompuServe)
316 Occidental Ave. S, Suite 200
Seattle, WA 98104
(800) 777-9638 or (208) 447-0300
Fax: (208) 447-9008

Stampede Technologies Inc.
78 Marco Lane
Dayton, OH 45458
(800) 763-3423 or (513) 291-5035
Fax: (513) 291-5040

Standard Microsystems Corp.
80 Arkay Drive
Hauppauge, NY 11788
(800) SMC-4-YOU or (516) 435-6900
Fax: (516) 273-1803

Starlight Networks Inc.
325 E. Middlefield Road
Mountain View, CA 94043
(415) 967-2774

Fax: (415) 967-0686

Sterling Software, Storage Management Div.
11050 White Rock Road
Rancho Cordova, CA 95670
(916) 635-5535
Fax: (916) 635-5604

StonyBrook Software
630 Johnson Ave, Suite 4
Bohemia, NY 11716
(516) 567-6060
Fax: (516) 567-6648

Storage Computer Corp.
11 Riverside St.
Nashua, NH 03062
(603) 880-3005
Fax: (803) 889-7232

Storage Dimensions
1656 McCarthy Blvd.
Milpitas, CA 95035
(800) 765-7895, ext. 1000

Sun Microsystems Computer Corp.
2550 Garcia Ave.
Mountain View, CA 94043
(800) 821-4643

Symantec Corp.
10201 Torre Ave.
Cupertino, CA 95014
(800) 441-7234 or (408) 253-9600
Fax: (408) 252-4694

SysKonnect Inc.
1922 Zanker Road
San Jose, CA 95112
(800) SK2-FDDI or (408) 725-4650
Fax: (408) 725-4654

Systems Enhancement Coop.
174 Chesterfield Industrial Blvd.
Chesterfield, MO 63005
(314) 532-2855

Fax: (314) 532-2037

Sytron Corp.
134 Flanders Road. PO Box 5025
Westboro, MA 01581-5025
(800) 877-0016 or (508) 898-0100
Fax: (508) 898-2677

**T**

T3plus Networking Inc.
3393 Octavius Drive
Santa Clara, CA 95054
(408) 727-5151 or (800) 477-7585
Fax: (408) 727-5151

Tadpole Technology Inc.
12012 Technology Blvd.
Austin, TX 78727
(512) 219-2200
Fax: (512) 219-2222

Tally Systems Corp.
PO Box 70
Hanover, NH 03755
(603) 643-1300 or (800) 262-3877
Fax: (603) 643-9366

Tandberg Data Inc.
2685 Park Center Drive
Simi Valley, CA 93065
(800) 258-8285
Fax: (805) 579-2555

TCL Inc.
41829 Albrae St.
Fremont, CA 94538
(510) 657-3800
Fax: (510) 490-5814

Technology Works Inc.
4030 Braker Lane West, Suite 350
Austin, TX 78759
(800) 688-7466 or (512) 794-8533
Fax: (512) 794-8520

Telebit Corp.
1315 Chesapeake Terrace
Sunnyvale, CA 94089
(800) TELEBIT
Fax: (408) 745-3310

Texas Instruments
PO Box 202230
Austin, TX 78720-2230

(800) TI-TEXAS
Fax: (512) 250-7329

Texas Microsystems Inc.
5959 Corporate Drive, PO Box 42963
Houston, TX 77242-2963
(800) 950-9199
Fax: (713) 541-8232

TGV Inc.
101 Cooper St.
Santa Cruz, CA 95060
(408) 457-5200
Fax: (408) 457-5205

The LAN Support Group Inc. (Bindview Corp.)
2425 FounlainView, Suite 390
Houston, TX 77057
(800) 749-8439 or (713) 789-0881
Fax: (713) 977-9111

Thomas-Conrad Corp.
12301 Technology Blvd.
Austin, TX 78727
(800) 332-8683

Top Microsystems Corp.
3320 Victor Court
Santa Clara, CA 95054
(800) 827-8721 or (408) 980-9813
Fax: (408) 980-8626

Touchstone Software Corp.
2130 Main St., Suite 250
Huntington Beach, CA 92648
(800) 531-0540 or (714) 969-7746
Fax: (714) 960-1886

Traffic Software Inc.
2300 Corporate Blvd., Ste. 241
Boca Raton, FL 33431
(407) 995-5282
Fax: (407) 990-5272

TransFax Corp.
6133 Bristol Parkway, Suite 275

Culver City, CA 90230
(310) 641-0439
Fax: (310) 641-4076

Transition Engineering Inc.
7090 Shady Oak Road
Eden Prairie, MN 55344
(800) 267-4908
Fax: (612) 941-2322

Trax Softworks Inc.
5840 Uplander Way
Culver City, CA 90230-6620
(800) 367-8729 or (310) 649-5800
Fax: (310) 649-6200

Trellis
225 Turnpike Road
Southborough, MA 01772
(800) 793-3390 or (508) 485-7200
Fax: (508) 485-3044

Trellis Communications Corp.
592 Harvey Road
Manchester, NH 03103-3320
(603) 668-1213
Fax: (603) 668-9211

Trend Micro Devices Inc.
2421 W. 205th Street, Suite D-100
Torrance, CA 90501
(310) 782-8190
Fax: (310) 328-5892

TRENDware International Inc.
2421 W. 205th St, D-102
Torrance, CA 90501
(310) 328-7795
Fax: (310) 328-7798

Tricord Systems
3750 Annapolis Lane
Plymouth, MN 55447
(800) TRICORD or (612) 557-9005
Fax: (612) 557-8403

Trinzic Corp.
101 University Ave
Palo Alto, CA 94301
(800) 952-8779 or (603) 427-0444
Fax: (603) 427-0385

Trio Information Systems Inc.
8601 Six Forks Road, Suite 105
Raleigh, NC 27615
(800) 880-4400 or (919) 846-4990
Fax: (919) 846-4997

Tripp Lite
500 N. Orleans St.
Chicago, IL 60610-4188
(312) 755-5401
Fax: (312) 644-6505

Triticom
PO Box 444180
Eden Prairie, MN 55344
(612) 937-0772
Fax: (612) 937-1998

Triton Technologies Inc.
200 Middlesex Turnpike
Iselin, NJ 08830
(800) 322-9440
Fax: (908) 855-9608

**U**

U.S. Robotics Inc.
8100 N. McCormick Blvd.
Skokie, IL 60076
(800) 877-2677 or (708) 982-5001
Fax: (708) 933-5800

UNICOM Electric Inc.
11980 Telegraph Road, Suite l03
Santa Fe Springs, CA 90670
(800) 346-6668 or (310) 946-9650
Fax: (310) 946-9167

Unisys Corp.
2700 N. 1st St.
San Jose. CA 95134-2028
(800) 448-1424 or (408) 434-2185
Fax: (408) 434-2122

UPSONIC Inc.
29 Journey
Aliso Viejo, CA 92656
(800) UPSONIC or (714) 448-9500
Fax: (714) 448-9555

**V**

VYCOR Corp.
5411 Berwyn Road
College Park, MD 20740
(800) 888-9267
Fax: (301) 220-0727

**W**

Walker, Richer & Quinn Inc.
1500 Dexter Ave. N
Seattle, WA 98109
(800) 872-2829 or (206) 217-7100
Fax: (206) 217-0293

Wandel & Goltermann Technologies Inc.
1030 Swabia Court
Research Triangle Park, NC 27709
(800) 277-7404
Fax: (919) 481-4372

Wang Laboratories Inc.
One Industrial Ave.
Lowell, MA 01851
(800) 639-9264
Fax: (508) 967-0828

Wavetek Corp.
9145 Balboa Ave.
San Diego, CA 92123
(800) 854-2708 or (61 9) 279-2200
Fax: (619) 450-0325

Wellfleet Communications Inc.
8 Federal St.
Billerica, MA 01821
(508) 670-8888
Fax: (508) 436-3658

Winchester Systems Inc.
400 W. Cummings Park
Woburn, MA 01801
(800) 325-3700 or (617) 933-8500
Fax: (617) 933-6174

Wingra Technologies Inc.
450 Science Drive, One West
Madison, WI 53711-1169
(800) 544-5465
Fax: (608) 238-8986

Wollongong Group Inc.
1129 San Antonio Road
Palo Alto, CA 94086

(415) 962-7000
Fax: (415) 962 0286

WordPerfect, the Novell Applications Group
1555 N. Technology Way
Orem, UT 84058-2399
(800) 451-5151 or (801) 225-2000
Fax: (801) 222-5077

Wright Line Inc.
160 Gold Star Blvd.
Worcester, MA 01606
(800) 225-7348
Fax: (508) 853-8904

Wyse Technology Inc.
3471 N. First St.
San Jose, CA 95134-1803
(800) GET-WYSE or (408) 473-1200
Fax: (408) 473-1222

**X**

XCd Inc.
2172 Dupont Drive, Suite 10
Irvine, CA 92715
(714) 476-7855
Fax: (714) 752-0609

XcelleNet Inc.
5 Concourse Parkway, Suite 200
Atlanta, GA 30328
(800) 322-3366 or (404) 804-8100
Fax: (404) 804-8102

Xinet
2560 9th St., Suite 312
Berkeley, CA 94710
(510) 845-0555
Fax: (510) 644-2680

Xinetron Inc.
2302 Walsh Ave.
Santa Clara, CA 95051
(800) 345-4415 or (408) 727-5509
Fax: (408) 727-6499

Xircom
26025 Mureau Road
Calabasas, CA 91302
(800) 874-7875 or (818) 878-7600
Fax: (818) 878-7830 or (818) 878-7175

XNET Technology Inc.
426 S. Hillview Drive
Milpilas, CA 95035-5464
(800) 788-0148 or (408) 263-6888
Fax: (408) 263-8898

XSoft, A Div. of Xerox Corp.
3400 Hillview Ave.
Palo Allo, CA 94303
(800) 428-2995 or (415) 813-6920
Fax: (415) 813-7499

Xylogics Inc.
53 Third Ave.
Burlington, MA 01803

(800) 89-ANNEX
Fax: (617) 273-5392

Xyplex Inc.
295 Foster St.
Littleton, MA 01460
(800) 338-5316
Fax: (508) 952-4702

Y

**Z**

Zenith Electronics Corp.
1000 Milwaukee Ave.
Glenview, IL 60025
(800) 788-7244 or (708) 391-8000
Fax: (708) 391-8919

ZERO ONE NetWorking
4920 E. La Palma Ave.
Anaheim, CA 92807
(714) 693-0804
Fax: (714) 693-0705

ZyXEL
4920 E. La Palma Ave.
Anaheim, CA 92807
(714) 693-0808
Fax: (714) 693-0705

# Acronyms

# A

| | |
|---|---|
| AAL | ATM Adaptation Layer |
| AARP | AppleTalk Address Resolution Protocol |
| AC | Access Control |
| AC | Alternating Current |
| ACE | Advanced Computing Environment |
| ACK | Acknowledgement |
| ACL | Access Control List |
| ACM | Association for Computing Machinery |
| ACS | Asynchronous Communications Server |
| AD | Administrative Domain |
| ADSP | AppleTalk Data Stream Protocol |
| AEP | AppleTalk Echo Protocol |
| AFP | AppleTalk Filing Protocol |
| AI | Artificial Intelligence |
| AI | Authentication Information |
| AIIM | Association for Information and Image Management |
| AIX | Advanced Interactive Executive |
| ALM | AppWare Loadable Module |
| ALU | Arithmetic Logic Unit |
| AM | Active Monitor |
| AM | Amplitude Modulation |
| AMD | Advanced Micro Devices |
| AMP | Active Monitor Present |
| ANSI | American National Standards Institute |
| AOCE | Apple Open Collaborative Environment |
| API | Application Program Interface |
| APPC | Advanced Program-to-Program Communications |
| APPN | Advanced Peer-to-Peer Networking |
| ARAP | AppleTalk Remote Access Protocol |
| ARL | Access Right List |
| ARL | Adjusted Ring Length |
| ARP | Address Resolution Protocol |
| ARPA | Advanced Research Projects Agency |
| ASCII | American Standard Code for Information Interchange |
| ASP | AppleTalk Session Protocol |
| ATA | ARCnet Trade Association |
| ATM | Asynchronous Transfer Mode |
| ATP | AppleTalk Transaction Protocol |
| ATPS | AppleTalk Print Services |
| AU | Administrative Unit |
| AUI | Attachment Unit Interface |
| AURP | AppleTalk Update Routing Protocol |
| AWG | American Wire Gauge |

## B

| | |
|---|---|
| BBS | Bulletin Board System |
| BCC | Block Check Character |
| BCD | Binary Coded Decimal |
| BGP | Border Gateway Protocol |
| BIND | Berkeley Internet Name Domain |
| BIOS | Basic Input/Output System |
| BISDN | Broadband Integrated Services Digital Network |
| BIT | Binary Digit |
| BIU | Basic Information Unit |
| BIU | Bus Interface Unit |
| BLAST | Blocked Asynchronous/Synchronous Transmission |
| BNC | Bayonet-Neill-Concelman |
| BOC | Bell Operating Company |
| BOOTP | Bootstrap Protocol |
| BPDU | Bridge Protocol Data Unit |
| bps | bits per second |
| Bps | bytes per second |
| BRI | Basic Rate Interface |
| BSC | Binary Synchronous Communications |
| BSD | Berkeley Software Distribution |
| BTAM | Basic Telecommunications Access Method |
| BTU | Basic Transmission Unit |

## C

| | |
|---|---|
| CAD | Computer-Aided Design |
| CAE | Computer-Aided Engineering |
| CAM | Computer-Aided Manufacturing |
| CAN | Campus-Area Network |
| CASE | Computer-Assisted Software Engineering |
| CATV | Cable Television |
| CAU | Controlled Access Unit |
| CBT | Computer-Based Training |
| CC | Carbon Copy |
| CC | Cluster Controller |
| CC | Country Code |
| CCITT | Consultative Committee for International Telegraphy and Telephony |
| CD | Carrier Detect |
| CD | Change Directory |
| CD | Collision Detection |
| CD | Compact Disc |
| CDDI | Copper Distributed Data Interface |
| CDPD | Cellular Digital Packet Data |
| CERT | Computer Emergency Response Team |
| CGI | Computer Graphics Interface |
| CI | Copy Inhibit |
| CICS | Customer Information Control System |
| CIM | Computer-Integrated Manufacturing |
| CIO | Chief Information Officer |
| CIS | CompuServe Information Services |
| CISC | Complex Instruction Set Computer |
| CLNP | Connectionless Network Protocol |
| CLNS | Connectionless-Mode Network Service |

| | |
|---|---|
| CLS | Clear Screen |
| CM | Configuration Management |
| CMIP | Common Management Information Protocol |
| CMIS | Common Management Information Service |
| CMOS | Complementary Metal Oxide Semiconductor |
| CMOT | Common Management Information Services and Protocol over TCP/IP |
| CN | Common Name |
| CN | Country Name |
| CNA | Certified Novell Administrator |
| CNE | Certified Novell Engineer |
| CNI | Certified Novell Instructor |
| CO | Connection-Oriented |
| CONS | Connecton-Oriented Network Service |
| COS | Corporation for Open Systems |
| COSE | Common Open Software Environment |
| CP | Customer Premises |
| CPE | Customer Premises Equipment |
| CPIC | Common Programming Interface for Communication |
| CPS | Characters per Second |
| CR | Connection Request |
| CRC | Cyclic Redundancy Request |
| CRS | Configuration Report Server |
| CSMA | Carrier Sense with Multiple Access |
| CSMA/CD | Carrier Sense with Multiple Access and Collision Detection |
| CSU | Channel Service Unit |
| CSU/DSU | Channel Service Unit/Data Service Unit |
| CTI | Computer Telephone Integration |
| CTS | Clear to Send |
| CUA | Common User Access |
| CUI | Common User Interface |
| CUT | Control Unit Terminal |

## D

| | |
|---|---|
| DA | Destination Address |
| DAC | Dual Attachment Concentrator |
| DARPA | Defense Advanced Research Projects Agency |
| DAS | Dual Attachment Station |
| DASD | Direct Access Storage Device |
| DAT | Digital Audio Tape |
| dB | Decibel |
| DBMS | Database Management System |
| DC | Direct Current |
| DCA | Document Content Architecture |
| DCB | Directory Cache Buffer |
| DCB | Disk Coprocessor Board |
| DCE | Data Communications Equipment |
| DCE | Distributed Computing Environment |
| DCF | Distributive Computing Facility |
| DCN | Data Communication Network |
| DCS | Distributed Computing System |
| DDA | Domain Defined Attribute |
| DDBMS | Distributed Database Management System |
| DDE | Dynamic Data Exchange |
| DDM | Distributed Data Management |

| | |
|---|---|
| DDN | Defense Data Network |
| DDP | Datagram Delivery Protocol |
| DDS | Dataphone Digital Service |
| DDS | Digital Data Service |
| DEB | Directory Entry Blocks |
| DES | Data Encryption Standard |
| DET | Directory Entry Table |
| DI | Delete Inhibit |
| DIA | Document Interchange Architecture |
| DID | Destination ID |
| DID | Direct Inward Dialing |
| DIP | Dual In-Line Package |
| DISOSS | Distributed Office Supported System |
| DIX | Digital Intel Xerox |
| DLC | Data-Link Control |
| DLL | Data-Link Layer |
| DLL | Dynamic Link Library |
| DLSw | Data Link Switching |
| DLT | Digital Linear Tape |
| DMA | Direct Memory Access |
| DME | Distributed Management Environment |
| DMI | Desktop Management Interface |
| DMTF | Desktop Management Task Force |
| DNA | Digital Network Architecture |
| DNS | Domain Name System |
| DOD | Department of Defence |
| DOD | Direct Outward Dialing |
| DOE | Department of Energy |
| DOS | Disk Operating System |
| DPA | Demand Protocol Architecture |
| DPI | Dots per Inch |
| DPMI | DOS Protected Mode Interface |
| DQDB | Distributed Queue Dual Bus |
| DRAM | Dynamic Random Access Memory |
| DRP | Directory Replication Protocol |
| DS | Directory Service |
| DSAP | Data-Link Service Access Point |
| DSAP | Destination Service Access Point |
| DSE | Data Switching Equipment |
| DSU | Data Service Unit |
| DSU/CSU | Data Service Unit/Channel Service Unit |
| DTE | Data Terminal Equipment |
| DTMF | Dual Tone Multifrequency |
| DTR | Data Terminal Ready |

## E

| | |
|---|---|
| EBCDIC | Extended Binary Coded Decimal Interchange Code |
| EC | European Community |
| ECC | Error-Correcting Code |
| ECMA | European Computer Manufacturers Association |
| ECNE | Enterprise Certified Novell Engineer |
| ED | Ending Delimiter |
| EDA | Embedded Document Architecture |
| EDI | Electronic Document Interchange |

EFF     Electronic Freedom Foundation
EIA     Electronic Industries Association
EISA    Extended Industry Standard Architecture
ELAP    EtherTalk Link Access Protocol
EMA     Electronic Mail Association
EMA     Enterprise Management Architecture
EMI     Electromagnetic Interference
EMS     Expanded Memory Specification
EPS     Encapsulated PostScript
ESD     Electronic Software Distribution
ESDI    Enhanced Small Device Interface
ES-IS   End System to Intermediate System
ETR     Early Token Release

## F

FAQ     Frequently Asked Questions
FAT File Allocation Table
FCB     File Cache Buffer
FCS     Frame Check Sequence
FDDI    Fiber Distributed Data Interface
FDM     Frequency Division Multiplexing
FEP     Front-End Processor
FEXT    Far-End Crosstalk
FM      Frequency Modulation
FOIRL   Fiber-optic Inter-Repeater Link
FR      Frame Relay
FS      File Server
FTAM    File Transfer, Access, and Management
FTP     File Transfer Protocol

## G

GOSIP   Government Open Systems Interconnection Profile
GUI     Graphical User Interface

## H

HAL     Hardware Abstraction Layer
HCSS    High-Capacity Storage System
HDLC    High-Level Data Link Control
HFS     Hierarchical File System
HLLAPI  High-Level Language Application Program Interface
HMA     High Memory Area
HMI             Hub Management Interface
HPFS    High-Performance File System
HSM     Hierarchical Storage Management

## I

IAB     Internet Activities Board
ICA     Intelligent Communications Adapter
ICMP    Internet Control Message Protocol

| | |
|---|---|
| IDAPI | Integrated Database Application Program Interface |
| IDC | International Data Corp. |
| IDE | Integrated Drive Electronics |
| IDP | Internet Datagram Protocol |
| IEEE | Institute of Electrical and Electronics Engineers |
| IETF | Internet Engineering Task Force |
| IFS | Installable File System |
| INT | Interrupt |
| IPC | Interprocess Communication |
| IPL | Initial Program Load |
| IPX | Internetwork Packet Exchange |
| IR | Infrared |
| IRL | Inter-Repeater Link |
| IRM | Inherited Rights Mask |
| IRQ | Interrupt Request Line |
| ISAM | Indexed Sequential Access Method |
| ISDN | Integrated Services Digital Network |
| IS-IS | Intermediate System to Intermediate System |
| ISO | International Standards Organization |
| ITT | Invitation to Transmit |
| ITU | International Telecommunications Union |

**J**

| | |
|---|---|
| JPEG | Joint Photographic Experts Group |

**K**

**L**

| | |
|---|---|
| LAA | Locally-Administered Address |
| LAM | Lobe Attachment Module |
| LAN | Local Area Network |
| LAP | Link Access Protocol |
| LAT | Local Area Transport |
| LATA | Local Access and Transport Area |
| LC | Link Control |
| LEC | Local Exchange Carrier |
| LEN | Low-Entry Networking |
| LIM | Lotus, Intel, Microsoft |
| LIMS | Lotus Intel Microsoft Specifications |
| LIP | Large Internet Packet |
| LIPX | Large Internetwork Packet Exchange |
| LLAP | LocalTalk Link Access Protocol |
| LLC | Logical Link Control |
| LRU | Least Recently Used |
| LSAP | Link Service Access Point |
| LSL | Link Support Layer |
| LU | Logical Unit |

**M**

| | |
|---|---|
| MAC | Media Access Control |
| MAN | Metropolitan Area Network |
| MAP | Manufacturing Automation Protocol |
| MAPI | Messaging Application Program Interface |
| MAU | Medium Attachment Unit |
| MAU | Multistation Access Unit |
| MCA | Micro Channel Architecture |
| MD | Management Domain |
| MDI | Multiple Document Interface |
| MHS | Message Handling Service |
| MHS | Message Handling System |
| MIB | Management Information Base |
| MIC | Media Interface Connector |
| MIF | Management Information File |
| MIPS | Millions of Instructions per Second |
| MLI | Multiple Link Interface |
| MLID | Multiple Link Interface Driver |
| MNP | Microcom Networking Protocol |
| MO | Magneto-Optical |
| MPDU | Message Protocol Data Unit |
| MPI | Multiple Protocol Interface |
| MPR | MultiProtocol Router |
| MRM | Maximum Rights Mask |
| MSAU | Multistation Access Unit |
| MSL | Mirrored Server Link |
| MTA | Message Transfer Agent |
| MTBF | Mean Time Between Failures |
| MTL | Message Transfer Layer |
| MUX | Multiplexer |

## N

| | |
|---|---|
| NAEC | Novell Authorized Education Center |
| NAK | Negative Acknowledgment |
| NASI | NetWare Asynchronous Services Interface |
| NAU | Network Addressable Unit |
| NAUN | Nearest Addressable Upstream Neighbor |
| NBP | Name Binding Protocol |
| NCB | Network Control Block |
| NCF | NetWare Command File |
| NCP | NetWare Core Protocol |
| NDD | NetWare Directory Database |
| NDIS | Network Driver Interface Specification |
| NDMS | NetWare Distributed Management Services |
| NEMA | National Electrical Manufacturers Association |
| NetBEUI | NetBIOS Extended User Interface |
| NetBIOS | Network Basic Input/Output System |
| NEXt | Near-End Crosstalk |
| NFS | Network File System |
| NIC | Network Information Center |
| NIC | Network Interface Card |
| NII | National Information Infrastructure |
| NIM | Network Interface Module |
| NIST | National Institute of Standards and Technology |
| NIU | Network Interface Unit |
| NLM | NetWare Loadable Module |

| | |
|---|---|
| NLSP | NetWare Link Service Protocol |
| NM | Network Management |
| NMA | NetWare Management Agent |
| NME | Network Management Entity |
| NMP | Network Management Protocol |
| NMS | NetWare Management System |
| NN | Negative Notification |
| NNS | NetWare Name Service |
| NOS | Network Operating System |
| NP | Network Provider |
| NBP | Name Binding Protocol |
| NPDU | Network Protocol Data Unit |
| NREN | National Research and Education Network |
| NRZ | Non-Return to Zero |
| NRZI | Non-Return to Zero, Inverted |
| NSA | National Security Agency |
| NSE | Network Support Encyclopedia |
| NT | New Technology |
| NUI | NetWare Users International |
| NVT | Novell Virtual Terminal |

## O

| | |
|---|---|
| OCA | Open Communication Architecture |
| OCE | Open Collaborative Environment |
| OCR | Optical Character Recognition |
| ODA | Open Document Architecture |
| ODBC | Open Database Connectivity |
| ODI | Open Data-Link Interface |
| ODINSUP | Open Data-Link Interface/Network Driver Interface Specification Support |
| OEM | Original Equipment Manufacturer |
| OLE | Object Linking and Embedding |
| OLTP | Online Transaction Processing |
| OMA | Object Management Architecture |
| OMG | Object Management Group |
| ONA | Open Network Architecture |
| ONC | Open Network Computing |
| OOP | Object-Oriented Programming |
| OS | Operating System |
| OSE | Open Systems Environment |
| OSF | Open Software Foundation |
| OSI | Open Systems Interconnection |
| OSPF | Open Shortest Path First |
| OTA | Office of Technology Assessment |
| OU | Organizational Unit |

## P

| | |
|---|---|
| PABX | Private Automatic Branch Exchange |
| PAD | Packet Assembler/Dissambler |
| PARC | Palo Alto Research Center |
| PBX | Private Branch Exchange |
| PCB | Printed Circuit Board |

| | |
|---|---|
| PCMCIA | Personal Computer Memory Card International Association |
| PCSN | Private Circuit-Switching Network |
| PD | Public Domain |
| PDF | Portable Document Format |
| PDF | Printer Definition File |
| PDN | Public Data Network |
| PDS | Premises Distribution System |
| PDU | Protocol Data Unit |
| PEP | Packet Exchange Protocol |
| PIM | Personal Information Manager |
| PIN | Personal Identification Number |
| PLL | Phase Locked Loop |
| PM | Phase Modulation |
| POP | Point of Presence |
| POP | Post Office Protocol |
| POSIX | Portable Operating System Interface Extension |
| POT | Point of Termination |
| POTS | Plain Old Telephone Service |
| PPM | Pages Per Minute |
| PPN | Private Packet Network |
| PPP | Point-to-Point Protocol |
| PPSN | Public Packet Switched Network |
| PRB | Packet Receive Buffer |
| PRI | Primary Rate Interface |
| PS | PostScript |
| PS | Print Server |
| PSDN | Packet-Switched Data Network |
| PSTN | Public-Switched Telephone Network |
| PU | Physical Unit |
| PVT | Permanent Virtual Terminal |

## Q

| | |
|---|---|
| QFA | Quick File Access |
| QIC | Quarter-Inch Cartridge |

## R

| | |
|---|---|
| RA | Read Audit |
| RAID | Redundant Array of Inexpensive Disks |
| RARP | Reverse Address Resolution Protocol |
| RBHC | Regional Bell Holding Company |
| RBOC | Regional Bell Operating Company |
| RDA | Remote Database Access |
| RDBMS | Relational Database Management System |
| REM | Ring Error Monitor |
| RF | Radio Frequency |
| RFI | Radio Frequency Interference |
| RFP | Request For Proposal |
| RFS | Remote File Server |
| RFS | Remote File System |
| RGB | Red Green Blue |
| RI | Rename Inhibit |
| RI | Ring In |
| RI | Ring Information |
| RI | Routing Information |

| | |
|---|---|
| RIP | Router Information Protocol |
| RIP | Routing Information Protocol |
| RISC | Reduced Instruction Set Computing |
| RJE | Remote Job Entry |
| RLL | Run-Length Limited |
| RM | Reference Modle |
| RMF | Remote Management Facility |
| RMON | Remote Network Monitoring |
| RO | Ring Out |
| ROM | Read Only Memory |
| RPC | Remote Procedure Call |
| RPG | Report Program Generator |
| RPL | Remote Program Load |
| RPS | Ring Parameter Service |
| RS | Ring Station |
| RSPX | Remote Sequenced Packet Exchange |
| RT | Routing Table |
| RTMP | Routing Table Maintenance Protocol |
| RUA | Remote User Agent |
| RW | Read Write |

## S

| | |
|---|---|
| S | Shareable |
| SA | Source Address |
| SAA | Systems Application Architecture |
| SAC | Single Attachment Concentrator |
| SAP | Service Access Point |
| SAP | Service Advertising Protocol |
| SAS | Single Attachment Station |
| SCSI | Small Computer System Interface |
| SDLC | Synchronous Data Link Control |
| SFT | System Fault Tolerance |
| SGML | Standard Generalized Markup Language |
| SGMP | Simple Gateway Management (Monitoring) Protocol |
| SIDF | System Independent Data Format |
| SLIP | Serial Line Internet Protocol |
| SM | Standby Monitor |
| SMB | Server Message Block |
| SMC | Standard Microsystems Corp. |
| SMDS | Switched Multimegabit Data Service |
| SMP | Session Management Protocol |
| SMP | Standby Monitor Present |
| SMP | Symmetric MultiProcessing |
| SMS | Storage Management Services |
| SMSA | Standard Metropolitan Statistical Area |
| SMT | Station Management |
| SMTP | Simple Mail Transfer Protocol |
| SNA | Systems Network Architecture |
| SNAP | SubNetwork Access Protocol |
| SNI | Subscriber Network Interface |
| SNMP | Simple Network Management Protocol |
| SNMP2 | Simple Network Management Protocol version 2 |
| SONET | Synchronous Optical Network |
| SPDU | Session Protocol Data Unit |

| | |
|---|---|
| SPF | Shortest Path First |
| SPP | Sequenced Packet Protocol |
| SPX | Sequenced Packet Exchange |
| SQE | Signal Quality Error |
| SQL | Structured Query Language |
| SRT | Source Routing Transparent |
| SSAP | Sessional Service Access Point |
| SSAP | Source Service Access Point |
| SUA | Stored Upstream Address |
| SVC | Switched Virtual Circuit |
| SVGA | Super VGA |

## T

| | |
|---|---|
| TCAM | Telecommunications Access Method |
| TCP | Transmission Control Protocol |
| TCP/IP | Transmission Control Protocol/Internet Protocol |
| TDDI | Twisted-Pair Distributed Data Interface |
| TDM | Time Division Multiplexing |
| TDR | Time Domain Reflectometer |
| TELNET | Telecommunications Network |
| TEN | Telephone Equipment Network |
| TFTP | Trivial File Transfer Protocol |
| THT | Token Holding Time |
| TIA | Telecommunications Industry Association |
| TIC | Token-Ring Interface Coupler |
| TIFF | Tagged Image File Format |
| TLAP | TokenTalk Link Access Protocol |
| TLI | Transport Layer Interface |
| TP | Transaction Processing |
| TP | Twisted-Pair |
| TPDDI | Twisted-Pair Distributed Data Interface |
| TPI | Transport Protocol Interface |
| TRIL | Token-Ring Interoperability Lab |
| TRT | Token Rotation Timer |
| TSA | Target Service Agent |
| TSA | Technical Support Alliance |
| TSAPI | Telephony Services API |
| TSO | Time-Sharing Option |
| TSR | Terminate-and-Stay-Resident |
| TTL | Time To Live |
| TTRT | Target Token Rotation Time |
| TTS | Transaction Tracking System |

## U

| | |
|---|---|
| UA | User Account |
| UAM | User Authentication Method |
| UART | Universal Asynchronous Receiver Transmitter |
| UDP | User Datagram Protocol |
| UI | User Interface |
| UMB | Upper Memory Block |
| UPS | Uninterruptible Power Supply |
| USOC | Uniform Service Order Code |
| UTP | Unshielded Twisted-Pair |

UUCP        UNIX-to-UNIX Copy Program

## V

VAP        Value-Added Process
VAR        Value-Added Reseller
VDM        Virtual DOS Machine
VGA        Video Graphics Array
VIM        Vendor Independent Messaging
VL        VESA Local
VLM        Virtual Loadable Module
VMS        Virtual Memory System
VNA        Virtual Network Architecture
VOM        Volt-Ohm-Meter
VT        Virtual Terminal
VXD        Virtual Device Driver

## W

WA        Write Audit
WAIS        Wide-Area Information Service
WAN        Wide-Area Network
WATS        Wide-Area Telephone Service
WOS        Workstation Operating System
WOSA        Windows Open System Architecture
WWW        World Wide Web

## X

XMS        Extended Memory Specification
XNS        Xerox Network Services

## Y

## Z
ZIP        Zone Information Protocol

# CD HELPdesk Series: Novell

File/Printing

Directory Services

Security

Cabling Topology Configuration

Backup, Storage & Disaster Recovery

Server Management

Workstation Connectivity

Internetworking

Database

Migration

Group Wise

Perfe Office Suite

Online Services

Education & Support

News

AppWare

NetWare v4.x

NetWare 3.x

NetWare v2.x

SFT LEVEL III

NetWare Connect

LAN WorkGroup

LAN WorkPlace

Manage-Wise

LANalyzer

NetWare Navigator

Enterprise MPR

NetWare for SAA

NetWare IP & NFS

## Click on any machine for more inform

## Help

To find information about a product or topic, position the cursor over the workstation or server associated with the topic and double-click the left mouse button. This will take you to a display that allows you to select questions, procedures, utilities, demos, and Certified Novell Engineer/Certified Novell Administrator (CNE/CNA) questions.

## Acknowledgments and Credits

Authors: Deni Connor and Ronald I. Nutter

Many thanks go to:
    Bob Pyle, RoboHelp consultant extraordinaire
    David Kearns, technical editor
    Lisa Barnett, copy editor
    Mary Madden, contributor
    Jerry Nokes, contributor
    Shane Weaver, graphic artist
    Terry Ahnstedt, Windows programming
    Dena Bockelman, multimedia assistant
    Dave Pallai, president, Charles River Media

From Ron, special thanks to:

My wife, Georgia, for allowing me to spend the long hours it took to write the book.

My parents, Jim & Joan, for encouraging me at an early age to follow my interests.

Fuzz and Little Bit, who spent many hours at my feet while working on this project. You will be missed.

From Deni, special thanks to:

My husband, Terry, who patiently kept the household together during the process.

My boss, Kathy Murphy of New Media Productions, for tolerating my schizoprenic work schedule.

My parents, Paul and Jean Lorentz, whose coffee table is running out of space.

Deni Connor is editor of *NetWare Solutions* magazine and the co-author of IDGs *NetWare for Dummies*, AP Professionals *LAN Survival: A Guerrilla Guide to NetWare* and *Networking the Desktop: Cabling, Configuration and Communications.* She is a former *LAN Times* technical editor and has written for *Datamation*, *PC Today, PC Novice, Computerworld, and LAN Times.*

Ronald I. Nutter is a Master Certified Novell Engineer (MCNE) and a Compaq Accredited Systems Engineer (ASE) in Lexington, KY. He is a contributing editor with *NetWare Solutions* and *Network World*. He is the "answer man" behind the NetWare Solutions "Help Desk" column. Ron has written for *Infoworld, LAN Times, Network Administrator, HP Palmtop Journal, IBM Exchange Journal, Networking News, Inside NetWare,* and the *NetWare Advisor.* He is a Network Professionals Association chapter president.



CD HELPdesk Series...Novell Products

Deni Connor & Ronald I. Nutter

Copyright 1995 CHARLES RIVER MEDIA, INC.
Rockland, Massachusetts

**HOW TO BEGIN**

1. Follow the CD-ROM Manufacturer's instructions on inserting the CD-ROM into your system.
2. 
3. From the Windows File Run option, type the path to your CD-ROM drive followed by the command SETUP.EXE. If for example your CD-ROM is drive D, then type D:\ SETUP.EXE and press the Enter key. The installation program will insert a program group called the CD HELPdesk Series. An icon called Novell Products starts the program.

-------------------------------------------------------

**SYSTEM REQUIREMENTS**

1. A 386 (or higher) PC with at least 4MB memory

2. A CD-ROM drive; mouse or pointing device

3. A VGA monitor supporting a resolution of 640x480 or higher

4. Either Microsoft Windows 3.1 or Windows '95(or DOS 3.3 or later);

5. NetWare v2.x, v3.x, or v4.x to run evaluation products.

------------------------------------------------
**TUTORIAL:**

After the demo is installed, youll see a graphic of a large local-area network (LAN). From this screen, take the mouse and position it over the machines that represent NetWare 4.x or NetWare 3.x. When you single-click the mouse on one of these machine, youll see another graphic.

From the top screen, click on the NetWare 4.x machine. At this graphic, you have a lot of choices. You can see questions and answers about NetWare 4.x. You can see the products and type of machines required to run this product. Or, you can take a test of Novell CNE or CNA questions. You can even take a look at some of the products specially designed for NetWare 4.x. You can even take a look at some of the products specially designed for NetWare 4.x when you select Utilities or Demos. If youre looking for the fastest way to perform an operation, select Procedures--it gives you Quick Lists that will save you time in a pinch.

Single-click on the Q & A icon and youll see a list of questions available. These questions are in green text. When you click on the question you want, youll see the question and the answer displayed. Select RCONSOLE error, by clicking the mouse once on the green text.

Youll see the question at the top and the answer down below. Click on the green text RCONSOLE in the question to see another feature of the CD HELPdesk Series. Doing this will give you the definition of RCONSOLE. To return to the question, simply click your mouse anywhere on the screen.

You can also search for glossary definitions by clicking on the Glossary button on the top of the screen. Lets search on the word demirror. Click on the Glossary button. When the Glossary box appears on the top left of the screen click on the letter D. Youll see the word demirror. Click on it. When youre finished, double-click anywhere on the screen to erase the Glossary.

From here you can return to the main screen and choose the 4.x icon again by pressing the Contents button along the top of the screen. From the second graphic, you can choose another icon.

Or you can click on the button along the top of the display market Find+. Find+ gives you a speedy way to search for topics youd like to see. For example, type DEMIRROR. Youll see the number of entries for demirror Find+ finds.

The CD HELPdesk Series has a number of other options youll find by clicking your mouse.

---------------------------------------------------

All brand names and product names mentioned in this CD are trademarks or service marks of their respective companies. Any omission or misuse (of any kind) of service marks or trademarks should not be regarded as intent to infringe on the property of others. The publisher recognizes and respects all marks used by companies, manufacturers, and developers as a means to distinguish their products.

---------------------------------------------

CHARLES RIVER MEDIA titles are available for site license or bulk purchase by institutions, user groups, corporations, etc. For additional information, please contact the Special Sales Department at 617-871-4184.

Requests for replacement of a defective disk must be accompanied by the original disk, your   mailing address, telephone number, date of purchase and purchase price.   Please state the nature of the problem, and send the information to CHARLES RIVER MEDIA, INC., P.O. Box 417, 403 VFW Drive, Rockland, Massachusetts 02370. CRM's sole obligation to the purchaser is to replace the disk, based on defective materials or faulty workmanship, but not on the operation or functionality of the product.

--------------------------------------------------

THE USE OF "IMPLIED WARRANTY" AND CERTAIN "EXCLUSIONS" VARY FROM STATE TO STATE, AND MAY NOT APPLY TO THE PURCHASER OF THIS PRODUCT.