

*user's manual*

# LANTastic™

*network operating system*

## **\*ATTENTION\***

Please note the addendum following Appendix II. It contains information about improvements and additions to the LANtastic software. A brief description of the contents follows:

Section 1, General Release Information and Common Problems, contains a general description of the software changes as well as solutions to frequently encountered problems.

Section 2, LANtastic Network Operating System User's Manual Updates, contains corrections of typographical errors and describes improvements to the network software.

Section 3, Documentation for LANPUP, describes features of this new pop-up utility that allows easy access to LANtastic features.

Section 4, NetBios SETUP Program Documentation, describes the use of this new program that allows the user to raise the SESSION and NCBS values if these values cannot be changed through the NETBIOS.

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## CHAPTER 1 HOW TO USE THIS MANUAL

This manual has been organized in a sequential fashion. If you read it from front to back, you will fully understand the LANtastic network operating system. For those who do not wish to read the entire manual, the following sections are recommended:

- Introduction to the LANtastic Network
- General Network Menu Concepts
- Quick Two Node Installation

Although the LANtastic network operating system is simple to use and set up, it has many features which are not found in other LANs. You should read the entire manual to fully realize your LAN's potential.

Most chapters in this manual assume that you are familiar with the LANtastic networking concepts. Therefore, it is recommended that you read Chapter 2, "Introduction to the LANtastic Network" first.

The LANtastic Network Operating System (NOS) extends PCDOS/MSDOS 3.1 to provide networking support with little memory overhead and a low cost.

LANtastic NOS features include:

- Low Memory Requirements
- Full DOS 3.1 File and Record Locking
- Uses NETBIOS Adapters for Communications
- Subdirectory Access Control by User or Group
- Peer-to-Peer: Shares Hard Disks, Floppy Drives, Printers
- Audit Trails
- Printer Spooling
- Electronic Mail System
- CD-ROM Drive Support

LANtastic NOS provides a full peer-to-peer networking system that includes hard disk and directory sharing, floppy drive sharing, simultaneous read and write access to files, printer spooling, mainframe-style security and audit trails in a compact, low-cost, easy to use package.

Programs and data located on hard disks of remote computers can be accessed by using standard DOS commands. There is no need to reformat a Server's hard disk or create partitions or volumes. In addition, LANtastic NOS can use SpeedStor, Disk Manager or other disk partitioning software that makes use of hard drives larger than 32 Megabytes.

Before using LANtastic NOS, you will need to be familiar with some key concepts and terminology.

---

LANtastic NOS has been designed to run on any network adapter that has a NETBIOS interface. A two node/server version of LANtastic NOS is provided with each LANtastic Starter Kit. A LANtastic NOS license can be purchased to support 3 to 120 nodes.

---

Drives (both floppy and hard) and directories are shared with full support of DOS 3.1 file and record locking calls. This allows networking versions of software to work together with LANtastic NOS. Although you do NOT need to purchase network versions of software to use LANtastic NOS, it is then up to the Network Manager to keep multiple users from working on the same file at the same time in non-network software. When this is not possible, you should make separate network directories for different users to use the non-network software.

---

LANtastic NOS allows the Server to be dedicated or non-dedicated. This means that a Server can be used as a fully functional computer even though it is sharing its resources across the network. Because LANtastic NOS requires such a small amount of memory on a Server, you can truly run it in non-dedicated mode with enough memory left over to run most of your applications programs.

Since a computer may be used as both a Server and a Node, you can login to a Server from another Server. You can also use your computer as a node to access another Server while other users are accessing your computer as a Server. There may be as many as 120 logged in nodes per Server.

---

The DOS program, SHARE.EXE implements file and record locking for networking software and keeps non-network software from collisions. This file should be added to your AUTOEXEC.BAT file when running LANtastic NOS. For more information refer to your DOS Manual.

## CHAPTER 2 INTRODUCTION TO THE LANtastic NETWORK

### NETBIOS COMPATIBILITY

### NETWORK SHARING OF DRIVES

### NON-DEDICATED SERVER

### FILE AND RECORD LOCKING

## PRINTER QUEUING AND DESPOOLING

## FULL NETWORK SECURITY

## AUDIT TRAILS

## HOW LANtastic NOS OPERATES

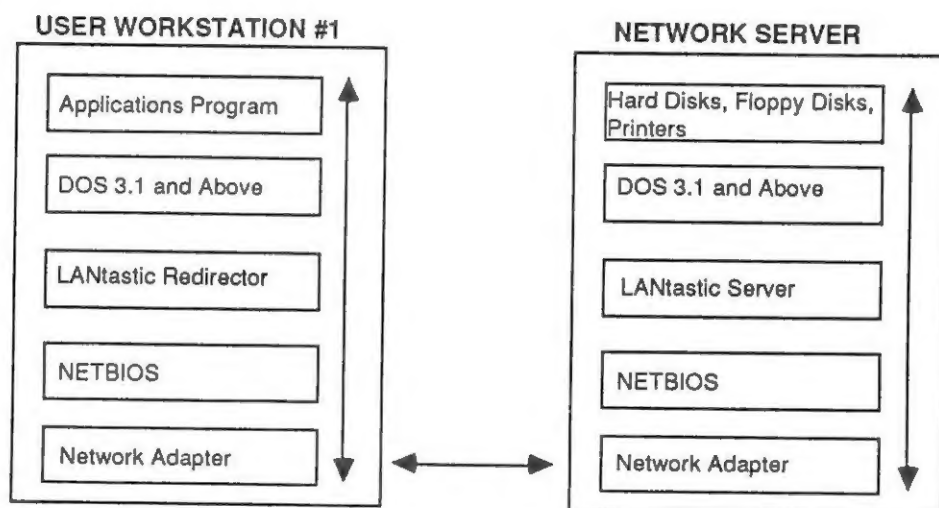
Printer spooling allows any printer on any Server to be shared across the network. Spooling means that data sent to the network printer is temporarily stored in a disk file on the Server and then sent to the printer. Servers can despool to three different printers: LPT1, LPT2, and LPT3. Any print job that is sent to a network printer is placed on the Server's disk before being despoiled.

LANtastic NOS security is similar to many mainframe computer systems. A user first "logs into" the Server with a username and password that LANtastic NOS checks for validity. To get access to a network subdirectory, a user must also have been given "access" to that subdirectory by the Network Manager. The Network Manager can also limit the user once he has logged in, by assigning access controls like Read, Write, Create File, Create Directory, Directory Lookup, Delete File, Delete Directory, Rename File, Execute Program, Change File Attributes and Physical Device Access.

A complete audit trail of each type of access that a user performs on a Server can be logged to a file on the Server. The Network Manager can designate that all successful logins, as well as unsuccessful attempts to login, be recorded. The audit trail also allows the Network Manager to check for users who are trying to access certain restricted files. Information such as number of characters printed on the network printer and login and logout time allow the Network Manager to have accurate charges for billing.

There are two main components of LANtastic NOS, a **Redirector** and a **Server**. The Redirector is responsible for getting requests from DOS programs for network files and devices, transmitting those requests across the network, receiving the results and returning to the DOS program. The Server receives requests from Redirectors running on many different computers, processes those requests and transmits the results back to the Redirectors. The Server makes all access checks and maintains the file and record locks as required by network applications software.

To access a Server on the network, a Redirector must be installed on the system. If the system will not be sharing its drives or devices (a Workstation or Node only), then the Redirector is all that needs to be installed on that system. If the system shares its drives and devices (a Workstation and a Server), then the Server program must also be installed. The following diagram shows the network flow from a Workstation to a Server.



Before a user at a node can access a Server's printers or drives, the user must first **login** to the Server to establish a network **session**. The session is the channel through which data is sent between the Server and the node. The user is checked at login time for a correct **username** and **password**. This is the first of many security checks in the LANtastic system.

To login to a Server, use the command:

```
NET LOGIN \\SERVERNAME USERNAME PASSWORD
```

For example:

```
NET LOGIN \\MAIN-SERVER BILL SECRET
```

To end a session with a Server, use the command:

```
NET LOGOUT \\SERVERNAME
```

For example:

```
NET LOGOUT \\MAIN-SERVER
```

---

Before discussing disk drive sharing, you will need to understand the difference between a network file path and a regular DOS file path. A file path under a single user DOS environment specifies the location of a file by its drive and the subdirectories that it is located within. For example:

```
C:\HOMEWORK\MATH\LESSON.001
```

specifies that the file LESSON.001 is contained in subdirectory MATH which is in the subdirectory HOMEWORK on the disk drive named C:. If you are not familiar with DOS paths, then you should refer to your DOS manual for more information.

LANtastic NOS expands on DOS paths with the simple substitution of a server name in place of a disk drive specifier to locate a file. For example:

```
\\MAIN-SERVER\HOMEWORK\ENGLISH\REPORT.001
```

locates the file REPORT.001 in subdirectory ENGLISH which is in subdirectory HOMEWORK on the **server** named MAIN-SERVER. Note that **double backslashes signify a server name**. Of course, you must be logged into the server in order to make use of it's resources. In the case of a network path in LANtastic, the server's name can be up to 15 characters, whereas the rest of the path is still limited to the DOS constraint of 8 characters followed by a 3 character extension.

---

Unfortunately, many programs written for DOS do not understand the concept of a network file path even though LANtastic's network path concept is the same as Microsoft's and IBM's. As in the previous example, it would be convenient to type:

```
DIR \\MAIN-SERVER\HOMEWORK
```

to see a list of the files contained on MAIN-SERVER's directory HOMEWORK. Unfortunately, this will not work. DOS's DIR command needs a disk drive in order to perform a directory search, even though internally LANtastic would have performed the request correctly. Because these programs want to communicate only with DOS disk drives, LANtastic allows **redirection** of a local disk drive to a network path.

## LOGGING INTO A SERVER

## NETWORK PATHS

## REDIRECTION

## SHARING OF DISK DRIVES

Based on the assumption that you do not have a D: disk, LANtastic allows you to create one via the redirection process and then use it for network requests. You can perform this redirection of the D: disk via the NET USE command:

```
NET USE D: \\MAIN-SERVER
```

Translated this means: Take **local** D: disk and connect it to the MAIN-SERVER. Now, any requests you make to your D: disk will be sent across the network and will USE the server's disk. For example:

```
DIR D:
```

would display a directory of \\MAIN-SERVER. You could also type:

```
DIR D:\HOMEWORK
```

and get the directory of \\MAIN-SERVER\HOMEWORK that you wanted previously.

To cancel the redirection of the disk drive, you would use the following command:

```
NET UNUSE D:
```

---

LANtastic NOS creates a **network control subdirectory** on the server which defines how the server looks to the outside world. The Network Manager sets up this subdirectory with **links** to floppies, hard drives, printers, or specific subdirectories that may be accessed by remote users. The links also contain **Access Control Lists or ACLs** which list the user's or groups and the types of access they are allowed to perform. The creation of links and how ACLs are used is covered in depth in the Network Manager section of this manual.

Briefly, the link is what the user on a node will see as an available device or subdirectory that he can attach to a disk drive specifier. Assume the following link has already been created on a server named MAIN-SERVER:

<u>Link</u>	<u>Actual Server Directory</u>
FLOPPYA	=> A:

All the user sees on his node is FLOPPYA, not the actual location of that link on the server. To use FLOPPYA, the user on a remote system redirects one of his local disks or printers to the server, attaching it to FLOPPYA through the NET USE command described previously. In this manner, a disk on the server computer is now accessed by the remote node as if the disk were attached to the node.

The user on the remote system simply selects the **local drive** letter that he wants to redirect across the network and performs a NET USE command:

```
NET USE D: \\MAIN-SERVER\FLOPPYA
```

The previous command redirects the node's D: disk to the server's A: floppy. If the node did not have a D: disk before the NET USE command, it would now! If the node did have a D: disk it would be overridden with the network drive until UNUSED later. Any action performed by the node to its D: disk will be performed on the server's A: floppy. For example, the command:

```
TYPE D:AUTOEXEC.BAT
```

would be converted internally by the Redirector on the local computer to:

```
TYPE \\MAIN-SERVER\FLOPPYA\AUTOEXEC.BAT
```

where \\MAIN-SERVER\FLOPPYA is substituted for the D: disk.

The request to open and read the AUTOEXEC.BAT file would then come across the network to the server and be linked to the real disk, checking both the destination of the link and the user's access rights to the link. In this example, \\FLOPPYA would be converted on the server to A:\ and the file A:\AUTOEXEC.BAT would be opened on behalf of the user and its data transmitted across the network to the remote node. The file AUTOEXEC.BAT would be typed on the node's screen.

To summarize, the steps that LANtastic uses to link to a device or subdirectory on the server are:

- 1) Remote user requests D: disk.
- 2) Remote Redirector converts D: to \\MAIN-SERVER\FLOPPYA.
- 3) Request transmitted across the network to \\MAIN-SERVER.
- 4) \\FLOPPYA is checked for access rights and converted to A:\.
- 5) Request returned to the remote user.

The user could also have typed:

```
TYPE \\MAIN-SERVER\FLOPPYA\AUTOEXEC.BAT
```

directly and bypassed any redirection to an intermediate disk drive.

In the example above, the D: disk on the node was redirected to a disk drive on the server. You can also make a link to a subdirectory. The next example uses the link:

<u>Link Name</u>	<u>Actual Server Directory</u>
LOTUS	=> C:\123

If the user redirects his E: disk to LOTUS, as in the following command:

```
NET USE E: \\MAIN-SERVER\LOTUS
```

the user's E: disk is redirected to the server's subdirectory C:\123. As far as the remote node is concerned, E: is a disk. However, any actions on files will be contained within the server's C:\123 subdirectory. The sequence of events looks like this:

- 1) Remote user requests E: disk.
- 2) Remote redirector converts E: to \\MAIN-SERVER\LOTUS.
- 3) Request transmitted across the network to \\MAIN-SERVER.
- 4) LOTUS is checked for access rights and converted to C:\123.
- 5) Request is performed and returned to the remote user.

If the user makes a subdirectory on his E: disk:

```
MKDIR E:\TEST
```

The actual subdirectory C:\123\TEST will be made on the server.

You should be getting an idea of the power and security of LANtastic NOS. If the Network Manager does not create a link to a subdirectory on the server, remote

users are prevented from getting access to that subdirectory - completely! You are not limited to USEing the link directories themselves, you can also redirect a disk to a subdirectory within a link. For example:

**NET USE G: \\MAIN-SERVER\LOTUS\TEST**

takes the link LOTUS which is C:\123, appends to it the subdirectory TEST and makes it the link for G:. Now G: is linked to the server's C:\123\TEST subdirectory. Anything the remote user does to G: will be done to the server's C:\123\TEST subdirectory. The sequence of events would look like:

- 1) Remote user requests G: disk.
- 2) Remote Redirector converts G: to \\MAIN-SERVER\LOTUS\TEST.
- 3) Request transmitted across the network to \\MAIN-SERVER.
- 4) LOTUS is checked for access rights and converted to C:\123.  
TEST remains on the path: C:\123\TEST.
- 5) Request is performed and returned to the remote user.

## SECURITY

This brings up a security point: **only links are checked for access rights**. If you want certain persons to have access to C:\123 and its subdirectories and another class of users to have access to C:\123\TEST only, then you would need to create two links:

<u>Link Name</u>	<u>Actual Server Directory</u>
LOTUS	=> C:\123
SUBLOTUS	=> C:\123\TEST

Users who have the right to access LOTUS also have access to all subdirectories under C:\123, including C:\123\TEST. Users who have access to SUBLOTUS can only access only those files and subdirectories contained within C:\123\TEST.

At this point it is important to define the access control security contained within LANtastic NOS.

You may care about security or you may not. Fortunately, LANtastic has plenty of security if you need it, yet doesn't get in the way if you don't. LANtastic has three major security gates: 1) You must login to a server with a valid username and password before any resources may be used on that server, 2) Access Control Lists of users or groups of users restrict access within a particular network link, and 3) Audit Trails which track the use of a server.

## LOGGING IN AND OUT

Logging in and out is much like a mainframe computer system. You are assigned a username and a password by the Network Manager. No username, no entry - period. The command to login to a server is:

**NET LOGIN \\SERVER-NAME USERNAME PASSWORD**  
e.g. **NET LOGIN \\MAIN-SERVER BILL SECRET**

If someone is going to look over your shoulder when you type this command, LANtastic can hide your keystrokes. Refer to the NET command section of the LANtastic user's manual.

## ACLs, ACCESS CONTROL LISTS

The second level of security, ACLs, are a bit more involved but quite simple to understand. As explained earlier, each link is setup by the Network Manager to point to the actual area on the server for network requests. An ACL is a list of the

users by username and the types of access that they will have while using this link.

## ACL ACCESS TYPES

Listed below are the types of accesses that LANtastic NOS supports:

- R Read Access**  
User can open a file for reading.
- W Write Access**  
User can open a file for writing.
- C Create File**  
User can only create a NEW file. If Write is also on, a user can create and overwrite an existing file.
- M Make Directory**  
User can create a new subdirectory.
- L Allow File Lookups (DIR's)**  
User can display/search a directory or subdirectory.
- D Delete Files**  
User can delete a file.
- K Delete (Kill) Directories**  
User can remove/delete a subdirectory.
- N Rename (Name) Files**  
User can rename an existing file.
- E Allow Program Execution**  
User has the right to execute a program. Some applications, like Microsoft Windows, do not "Execute" programs. Windows reads a program into memory and does not perform a DOS Execute system call. In this case, you must give the user read access to run programs. COMMAND.COM always uses the Execute system call.
- A Change File Attributes**  
Attributes such as read-only, hidden, system and archive may be changed.
- P Allow Physical Access to Devices**  
**NOTE — Do not normally set this ACL!**  
This ACL allows the user to connect to a DOS device directly and not through a spooler. This can result in the node having to wait for a long time for a print request. During these times, network requests and local requests can be suspended.

The ACL is a list of users by name or group and the set of rights that they are allowed. For example, a typical ACL would be:

BILL	RWCLE
ADMIN*	RWCLE
MANAGER	RWCMLDKNEA
*	.....

Username Bill can Read, Write and Create files, get DIRectory lists and Execute programs within this link. Anyone with the username ADMIN in the first five letters, such as ADMIN\_FRED would also have the same access rights as BILL. Manager has all access rights except physical device access. Everyone else, signified by the star "\*" has no access rights to anything in this link. If you do not need security, you could make star "\*" have all rights, as does the Manager in this example. When links are first created, the default is star "\*" with all access.

## SHARING PRINTERS

You can share printers across the network through redirections and links just as you did for disks. This time, however, the links contain an "@" sign at the beginning of each link name to separate the devices from the drive links. For example,

<u>Link</u>	<u>Actual Server Device</u>
@DRAFT	=> LPT1
@LQUALITY	=> LPT1
@LASER	=> LPT2

The remote user can redirect his printer to a network printer via the same NET USE command for drives:

```
NET USE LPT1 \\MAIN-SERVER\@DRAFT
NET USE LPT2 \\MAIN-SERVER\@LQUALITY
NET USE LPT3 \\MAIN-SERVER\@LASER
```

When the user prints a document to his LPT1, it will be "spooled" to the server's hard disk and wait in a print queue. The sequence of events is as follows:

- 1) Remote user requests LPT1.
- 2) Remote Redirector converts LPT1 to \\MAIN-SERVER\@DRAFT.
- 3) Request transmitted across the network to \\MAIN-SERVER.
- 4) @DRAFT is checked for access rights and converted to a file in the server's print spooling area.
- 5) The print data is placed on the server's disk.
- 6) When the printer pointed to by @DRAFT (LPT1) is free, the print job is printed for the user.

Notice that if the user prints to his LPT2, it also gets sent to the server's LPT1 printer. LANtastic NOS allows you to setup as many printer types as you desire for specifying Draft mode, Letter Quality, different fonts or whatever your printer can set for options.

This completes an introduction to LANtastic NOS. You should now be acquainted with how LANtastic NOS is structured, and how its most important commands work. The commands and concepts you should be familiar with include:

- Server
- Workstation or Node
- Network Paths
- Redirection for Printers and Disks
- Access Control Lists (ACL)
- NET USE
- NET UNUSE
- NET LOGIN
- NET LOGOUT
- Printer Spooling

The rest of the manual is devoted to setting up the LAN by the Network Manager and use of LANtastic through the NET commands and the NET window interface.

Two programs in the LANtastic network software, NET and NET\_MGR, have similar menu interfaces. A menu may contain several windows of information.

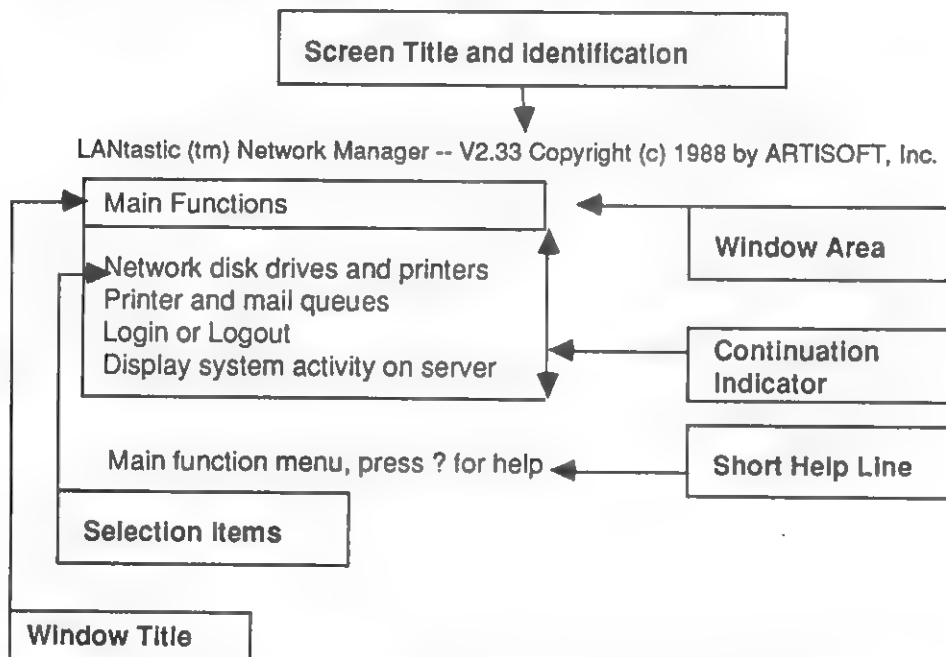
In this section we will explain general concepts about these menu interfaces. Each menu that is displayed has two similar characteristics:

- Common screen organization
- Common acceptable characters

Each screen or menu that is displayed consists of three major parts:

- The screen title and identification
- The short help line
- The window area which contains a title, selection items and a continuation indicator

A sample screen display follows:



The screen title and identification is located on the upper most line of the screen display. Its purpose is to identify the program that you are running.

The short help line is located at the very bottom of the screen. Its purpose is to give additional information about the currently displayed menu and to suggest helpful information. Most screens will contain the text "press ? for help" in the help line. If you press ?, you will get more detailed information about the current screen.

The window area is located between the screen title and short help lines. All interaction with the program is performed in this area. The window area may contain more than one window. The windows have the following general format:

- The window's title indicates the name or contents of the window. The current active window's title line is always highlighted.
- The selection items are information in the window that you can select, view, or

## CHAPTER 3 GENERAL MENU CONCEPTS

### SCREEN ORGANIZATION

## INTERACTION WITH THE MENUS

edit. To highlight a selection listed in a window, use the up or down arrow key to move the selection bar to that selection. Press the Enter key to choose the selection.

- The continuation indicator is used to signal that the selection items continue either above or below the window. Some windows are displayed with a limited amount of information, although they may contain much more information than is displayed. The continuation indicators inform you that more information is present.

Although visually similar, all windows may also be classified as view/select windows or as data entry windows.

---

LANTastic NOS is a window driven network operating system. This means that network connections are made very quickly with minimal keyboard entry. Some of the keys you will work with and their functions are:

Up Arrow	Moves to a previous selection line in a view/select window.
Down Arrow	Moves to the next selection line in a view/select window.
Left arrow	Used during data entry to move the cursor to the left.
Right Arrow	Used during data entry to move the cursor to the right.
Home	Positions to top of selection list.
End	Positions to end of selection list.
PgUp	Moves to previous page in selection list.
PgDn	Moves to next page in selection list.
Del	Deletes a selection item in a view/select window. Deletes the current character in a data entry window.
Ins	Inserts a selection item in a view/select window. Toggles between insert and overwrite in a data entry window. Insert is represented by a block cursor, while overwrite is represented by an underline cursor.
Back arrow	Deletes the previous character in a data entry window.
Esc	Exits the current window to the previous window. In most menus this has the effect of canceling the current operation. In the text editor menu this has the effect of ending (not aborting) the editing.
Enter	In a view/select window selects the current item. In a data entry window it signifies the end of data entry. In the text editor it enters one line and proceeds to the next line.
?	In a view/select window this key requests additional help.

When typing in a window, you can:

- Type over any previous text in the window.
- Use the left and right arrow keys to move right and left.
- Use the backspace key to delete a character to the left.
- Use the delete key to delete a character to the right.
- Use the insert key to place yourself in insert mode.

You do not have to use the window interface with LANtastic NOS. If you wish to execute all network interaction with batch files, there is a complete list of command line functions in Chapter 9 of this manual.

## CHAPTER 4 QUICK TWO COMPUTER INSTALLATION

Certain assumptions about your installation expertise are made in this section. If some terms are not familiar to you or you are having difficulty with the installation, then you should go to Chapters 5 and 6.

For simplicity, it is assumed that you have installed your NETBIOS compatible hardware and have found it to be fully functional. The quick installation only covers installation for two nodes, although it may be extrapolated to many nodes.

For the quick installation you will need to decide which node is to be the server and which the workstation. It is also assumed that your server has a hard disk (although it is not necessary).

The quick installation does not attempt to teach you the LANtastic operating system concept. It only instructs you in the steps you will perform to install the networking software. You should follow all of the steps sequentially. Do not skip steps or sections.

---

Before proceeding with the installation of LANtastic NOS, make a copy of the distribution disk(s) with the DOS Diskcopy command.

Place the copy of the distribution disk in drive A: and type:

```
C:  
A:NET_MGR
```

Select "Install Software" and press Enter.

Select "C:" and press Enter.

Select "Install server with redirector" and press Enter.

After the distribution files are copied to your disk, press Esc several times until you are back to your DOS prompt (C>). The server software is now copied to your disk. Now type:

```
CD \LANTASTI  
NET_MGR
```

Select "User account information" and press Enter.

Press Ins to create a user account. Type MANAGER for the username, then press Enter.

Type MANAGER for the password, then press Enter.

Press Enter for the description.

Type 2 for the number of concurrent logins, then press Enter.

Select "MANAGER", then press Enter.

Select "Privileges", then press AQMU. This creates a privileged Network Manager account that you will log into after bringing up the network.

Press Esc two times to get back to the "Main functions" menu. Select "Network access" and press Enter.

### INSTALLING SOFTWARE ON THE SERVER

## MODIFYING CONFIG.SYS

Press **Ins** to create a shared disk resource. Type the name **ROOT**, then press **Enter**.

Press **Ins** to create a shared printer resource. Type the name **@PRINTER**, then press **Enter**.

Press **Ins** to create a mailbox. Type the name **@MAIL**, then press **Enter**.

Select **"ROOT"** and press **Enter**.

Select **"Link path"** and press **Enter**. Type **"C:"**, then press **Enter**. This links the shared disk name, **ROOT**, to your server's disk **C:**.

Press **Esc** several times to return to your DOS prompt.

---

Before starting the server you should modify your **CONFIG.SYS** file to include the following lines:

```
FILES=50
FCBS=16,8
BUFFERS=30
LASTDRIVE=N
```

The above are minimum values. **LANtastic** will still run even if you don't alter your **CONFIG.SYS** file. It is recommended, however, that you at least make the alterations listed above.

## RUNNING THE LANtastic NETWORK

---

Make sure your **NETBIOS** software is installed. If you have **LANtastic** hardware type:

```
C:
CD\LANASTI
LANBIOS
```

to install the **NETBIOS** software. If you have other hardware, your **NETBIOS** software must be running for the network to start. Now type:

```
REDIR HOST (Replace "HOST" with the name of your Server)
SHARE      (You must have a path to SHARE.EXE)
SERVER
```

This will install the networking software. To check your installation, try logging into the server from the server. Type:

```
NET LOGIN \\HOST MANAGER MANAGER
NET USE D: \\HOST\ROOT
NET USE LPT1 \\HOST\@PRINTER
```

substituting the name of your server for the word **"HOST"**. This will log you into the server (the machine you are working on,) under the username and password of **"MANAGER"**, link disk **D:** to the server's disk **C:** (**ROOT**) and redirect **LPT1** to the server's spooled printer. Now type:

```
D:
DIR
```

You will now see a directory of your C: disk on network disk D:. You can run programs or issue any commands that you normally could on server drive C:. If you printed from a program on drive D:, the output would be redirected through the network to LPT1 on the server.

Don't reboot the server after the above sequence. Place the workstation's system disk in drive A: on the server. Now type:

```
C:
CD \LANTASTI
NET_MGR
```

Select "Install Software", then press Enter.

Select "A:", then press Enter.

Select "Install workstation (redirector only)", then press Enter.

After the software is copied, press Esc several times to return to the DOS prompt.

Take the disk you just made and insert it in the workstation's A: disk.

On the workstation install the NETBIOS software. If you have LANtastic hardware type:

```
A:
CD \LANTASTI
LANBIOS
```

Once the NETBIOS is installed, you can start the workstation. Type:

```
A:
CD \LANTASTI
REDIR REMOTE (Replace "REMOTE" with the name of your
workstation.)
```

This will bring up the workstation with machine name Remote. You can now login to the server. Type:

```
NET LOGIN \\HOST MANAGER MANAGER
NET USE D: \\HOST\ROOT
NET USE LPT1 \\HOST@PRINTER
```

substituting the name of the server you are trying to login to for "HOST". You have now connected to the server under the username and password "MANAGER". Your disk D: is linked to the server's disk C: (ROOT). Any printing will be spooled to the server. To verify your connection type:

```
D:
DIR
```

You will get a directory of the server's hard disk C:.

## INSTALLING SOFTWARE ON A WORKSTATION THAT USES A FLOPPY TO BOOT THE NETWORK

**INSTALLING  
SOFTWARE ON A  
WORKSTATION  
THAT USES A  
HARD DRIVE TO  
BOOT THE  
NETWORK**

Place the copy of the distribution disk in drive A: and type:

```
C:  
A:NET_MGR
```

Select "Install Software" and press Enter.

Select "C:" and press Enter.

Select "Install workstation (redirector only)", then press Enter.

After the software is copied, press Esc several times to return to the DOS prompt.

If you have LANtastic hardware, install the NETBIOS software on the workstation by typing:

```
C:  
CD\LANTASTI  
LANBIOS
```

Now type:

```
REDIR REMOTE (Replacing "REMOTE" with the name of your  
workstation.)
```

This will bring up the workstation with the name Remote. You can now login to the server. Type:

```
NET LOGIN \\HOST MANAGER MANAGER  
NET USE D: \\HOST\ROOT  
NET USE LPT1 \\HOST\@PRINTER
```

substituting the name of the server you are trying to login to for "HOST". You have now connected to the server under the username and password of "MANAGER", and your disk D: is linked to the server's disk C: (ROOT). Any printing will be spooled to the server. To verify your connection type:

```
D:  
DIR
```

You will get a directory of the server's hard disk C:.

If your server has a printer attached to LPT1, you can print a file from the workstation to the server. To print a file, type the following commands from the workstation:

```
A: or C: (type the workstation's boot disk)
CD \LANTASTI
NET PRINT filepath LPT1
```

where filepath is the file(s) you wish to print. For example:

```
NET PRINT \AUTOEXEC.BAT LPT1
```

Once you have issued this command the file will be sent to the server's queue. The file will probably not print until you issue the command:

```
NET QUEUE START \\HOST (Replace HOST with the
server's name)
```

which enables despooling on the server. The NET QUEUE command requires privileges and only works in this example because you are logged in as the Network Manager.

## CHAPTER 5 YOUR SOFTWARE DISTRIBUTION DISK

The software distribution disk that comes with LANtastic contains all of the necessary software to run the LANtastic network operating system. If you have purchased a LANtastic hardware starter kit, your software will allow you to network two computers. You will need an unlimited license to the NOS to network more than two computers.

Before you begin using LANtastic be sure to make a backup copy of your distribution disk. Make a label for the backup copy and write down any serial numbers which may be on your distribution disk. The serial numbers are important if you need to call for assistance.

The distribution disk contains several files and at least one subdirectory. A file called README.DOC is included in every distribution disk. This file contains additional instructions which may not be covered by this manual and/or information on software updates. You should read the README.DOC file before attempting to perform a software installation. At your system prompt type:

```
A>Type Readme.doc
```

The distribution disk files and their meanings are listed below.

README.DOC	Contains latest information about LANtastic. Always read this file first.
NET.EXE	Program which lets you access the network.
NET.HLP	Help text used by the NET program.
NET_MGR.EXE	Program which lets you install and setup your network.
NET_MGR.HLP	Help text used by NET_MGR program.
REDIR.EXE	LANtastic redirector that redirects DOS requests across the network.
SERVER.EXE	LANtastic server that processes network requests from remote nodes.
*LANBIOS.EXE	LANtastic hardware NETBIOS installation software. Consult your LANtastic hardware manual about this program.
*LANCHECK.EXE	NETBIOS hardware checkout program. Consult your LANtastic hardware manual about this program.
SAMPLES	<DIR> A directory containing sample batch files to assist you in creating your own custom batch files for starting the network.

\*optional files that may or may not appear on the distribution disk.

After installing the software, you may rename any of the above distribution files. You should, however, adhere to the following guidelines:

- Don't rename the files on the distribution disk itself. The software installation program expects the standard names.
- When renaming the NET.\* or the NET\_MGR.\* files rename them as pairs. For example, when renaming NET.EXE and NET.HLP, rename both files using the same extension:

```
RENAMENET.* NETWORK.*  
RENAMENET_MGR.* MANAGER.*
```

## CHAPTER 6 INSTALLATION AND THE NET\_MGR PROGRAM

### THE NETWORK CONTROL AND SOFTWARE DIRECTORIES

### RUNNING NET\_MGR

The NET\_MGR (Network Manager) program is used to install your network software and maintain your network server(s). You will normally run NET\_MGR each time you install networking software on a server or workstation. You will also run NET\_MGR to maintain user accounts, share server resources (i.e. hard disks, floppy drives, printers), set server startup parameters and maintain your server audit trails.

When you are installing LANtastic for the first time, the only option you will have under NET\_MGR is to install the software.

NET\_MGR maintains a special network control directory on your server where it keeps network information. The location of the network control directory is specified as the destination drive during software installation. The network control directory is only created if you are installing a server.

The default name of the network control directory is \LANTASTI.NET. Although you can use a different directory name when starting NET\_MGR, it is not recommended.

In addition to the network control directory, NET\_MGR creates a directory where all of the network software pertaining to your particular configuration is copied. The network software directory also resides on the destination drive. Its name is \LANTASTI.

The following figure illustrates the default names and structures of the directories which NET\_MGR creates at installation time.



The disk designators shown above are merely for illustration, the software could have been installed on any drive.

When NET\_MGR is run, the software assumes that the disk that you are working on contains a preexisting network control directory. If no network control directory is found (as in an initial software installation), NET\_MGR assumes that you are installing software.

To run NET\_MGR type:

```
[d:]NET_MGR [network-control-directory]
```

where

**d:**  
is the drive which contains the NET\_MGR program. If you are installing LANtastic for the first time, then d: would be A: or B:.

#### **network-control-directory**

is an optional argument which specifies the path of the network control directory. The default is \LANTASTI.NET. You should normally leave this argument blank.

For more information about the network control directory see Chapter 12, Advanced Topics.



If you are installing a full server configuration, then you should select the drive on which you want the network control directory to be created. Usually this is a hard disk, such as C:. Whenever you want to run NET\_MGR again, you should move to this drive.

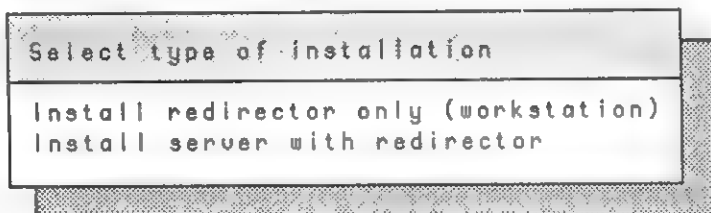
If you are installing a redirector only (workstation), then you should select the drive to which you want the network software to be copied. In most cases, if the workstation is floppy based and you are running NET\_MGR from the server, you will place the workstation's system disk in drive A: and select drive A:. You must make a LANtastic disk for each workstation on the network.

The following table enumerates some possible variations for installing software on a workstation.

NET_MGR Run From	Distribution Disk (source)	Destination Disk
Server	already installed	A:
Server	A:	B:
Workstation	A:	B:
Workstation	A:	C:

As you can see from the above table, workstation software can be installed from either the server or the workstation. Usually, the source disk and the destination disk will not be the same disk.

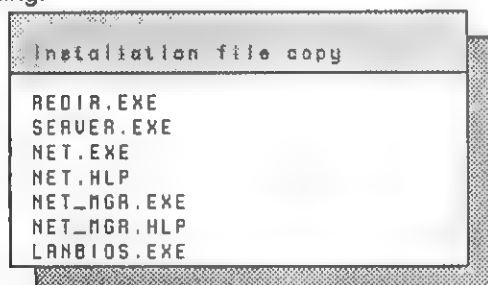
Once you have selected the destination disk for the software, you will need to select the type of network configuration you are installing.



You should select "redirector only" installation if the workstation will not share any of its resources on the network. You will be able to login to servers and use their resources from the workstation, but other workstations will not be able to log in to your computer. In other words, this workstation will not be a server.

You should select "server with redirector" if the computer will share resources on the network. In addition to being able to share resources on the network, you will also be able to log into other servers (including yourself) and use their resources.

Once you have selected the type of installation, NET\_MGR will copy files from the distribution disk to the destination disk. A menu similar to the following will appear. The contents of the menu may vary depending on the type of installation you are performing.

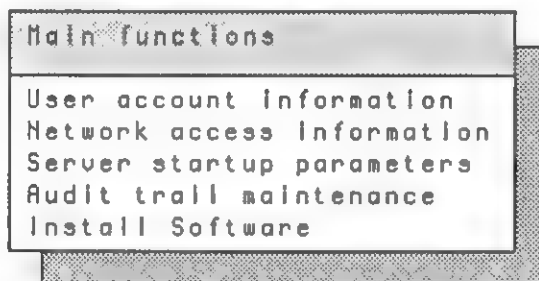


## SELECTION OF SERVER OR WORKSTATION CONFIGURATION

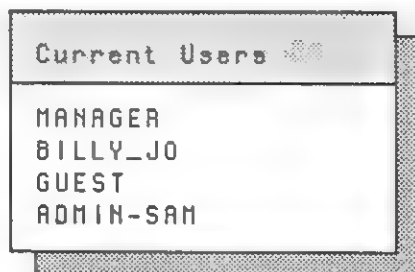
## CREATING NEW USER ACCOUNT INFORMATION

When you have finished installing the software, exit out of NET\_MGR by pressing Esc several times. If you are installing multiple copies of the network software, such as making floppies for remote workstations, you can remain in NET\_MGR and reselect the destination drive and type of software installation for each new floppy.

Before a user can log into a server and begin using the server's network resources, he must have a user account on the server. Although the server can be started without any user account information, no one will be able to login until you have created at least one user account. To create new user account information, select the "User account information" option in the "Main Functions" menu.



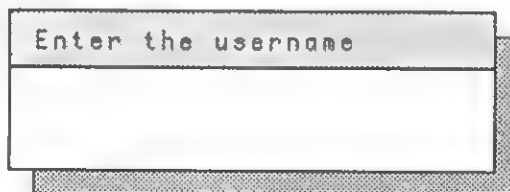
This option is also used to modify existing user accounts. A menu similar to the following will appear. If you have not entered any usernames previously, then the menu will not list any users.



When adding a new user you will be prompted for certain information like username, password, user description and number of concurrent logins. You will not be prompted, however, for the user's privileges. You may give a user privileges (or change any user information) by modifying the user account later.

## SPECIFYING A USERNAME

To enter a new user, press the Ins key. You will be prompted for the name of the user you wish to add:



The username may be up to 16 characters long and you can enter any valid filename character for the username. Upper and lower case characters are interchangeable. Wildcards ("\*") are not acceptable for usernames.

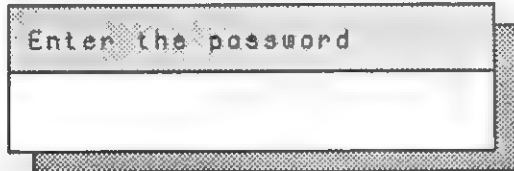
If you are creating a username which will be part of a group of users, you may want to preface the username by a group identification. For example, if you are creating a group of administrative users, you could begin each of their usernames

with the characters "ADMIN-":

ADMIN-MARY  
ADMIN-BOB  
ADMIN-MANAGER  
ADMIN-WILLIS

You may use the group identification preface (ADMIN-\*) when creating access control lists (ACLs).

Once you have entered a username you will be prompted to enter a password for the user:



Enter the password

A terminal window showing a prompt "Enter the password" followed by a blank line for input.

You may elect not to enter a password. It is recommended, however, to enter a password to maintain a minimum level of security on the network.

The password may be up to 16 characters long and it may contain any valid filename characters. Upper and lower case characters are interchangeable. As you type the password you will see it on the screen. The user will not see his password when he logs into the server. This will be the only time the password will be visible. Although you may change the password, you will never be able to see it again on the screen.

Having entered the user's password, enter a description of the user:

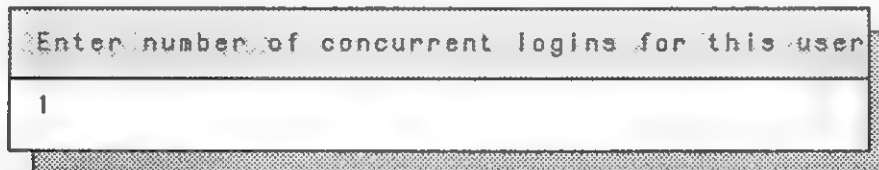


Enter the user description

A terminal window showing a prompt "Enter the user description" followed by a blank line for input.

Usually this information is for your own use. Typically you will enter the person's first and last name, but you could also enter a user's phone number or location. If you intend to bill the person for usage of the network, you may want to enter some kind of accounting code.

Usually only one person will log into a server under a particular username at any one time. There are times, however, when a user or users may want to login into the server from multiple remote nodes using the same username. This will usually be the case if you create a GUEST account (a generic type of user account). If more than one user will be logging in under the same username, you need to specify the possible number of concurrent logins. The following prompt is displayed:



Enter number of concurrent logins for this user

1

A terminal window showing a prompt "Enter number of concurrent logins for this user" followed by the number "1" on the input line.

The default, 1, is preentered for you on the input line. If you wish to specify another number, simply press the Del key and reenter a new number. You can

## SPECIFYING A PASSWORD

## SPECIFYING A USER DESCRIPTION

## SPECIFYING THE NUMBER OF CONCURRENT LOGINS

## MODIFYING CURRENT USER ACCOUNT INFORMATION

also enter the number 0 to disable the account from any logins. This would be a good idea if the user goes on vacation or is on extended leave. You can create disabled accounts and then enable them at a later date.

You may want to modify a user account for several reasons:

- Change user's name
- Change user's password
- Change user's description
- Add/delete privileges

To modify user account information select the "User account information" option in the "Main Functions" menu. Then select the username you wish to modify from the "Current users" menu. A menu similar to the following will appear:

Current users	User information, Enter to edit
MANAGER BILLY_JO GUEST ADMIN-SAM	Name: MANAGER Password: ***** Description: Network Manager Privileges: - QM - - Number of concurrent logins::10

To change any piece of user information except "Privileges", select the information and press Enter. A menu will appear listing the current user information. Type your changes on the insert line and press Enter. Do this for each piece of user account information that you wish to change except for "Privileges".

To add or change a user's "Privileges", position yourself on the selection and type a privilege letter to either enable or disable the privilege. When accounts are created for the first time they contain no privileges. The privilege letters and their meanings are listed below.

## ACCOUNT PRIVILEGES

### A - SuperACL Privilege

If enabled (an A appears on the privileges line), the Access Control Lists (ACLs) protecting subdirectories printers and sending mail will not be checked. This user will have access to every shared resource on the server. If disabled (the A does not appear on the privileges line), ACL protection is enforced. You may give this privilege to all user accounts if you are not concerned with network security. A typical user that would be given this privilege is the Network Manager.

### Q - SuperQueue Privilege

Enabling this privilege allows the user to view and manipulate all jobs in the print queue. When disabled the user can only see and control his own print jobs. The Q privilege also allows control over the server's despooler. You should give this privilege only to accounts which need to manipulate all jobs in the queue and in particular need to start and stop the despooler. The Network Manager would typically be given this privilege.

### M - SuperMail Privilege

If enabled, a user has the privilege to manipulate all mail in the mail queue. If disabled, a user can only manipulate mail which he has sent or which is sent to him. You will typically give this privilege to the network manager so that he can periodically check the mail queue to delete old mail.

### **P - Peer Privilege**

When enabled, the user's program performs across the network as if it were running on the server's computer. Some of the checks normally performed by the DOS SHARE program are bypassed. In particular, certain sharing violations are not enforced, although explicit record file locking and unlocking continues to work. Normally, you should NOT enable this privilege. You will probably use this privilege when trying to make certain non-network multiuser programs work on the network or when developing network programs.

### **U - User Auditing Privilege**

When enabled, the user may issue NET AUDIT commands and create audit entries in the server audit log. If disabled, user audit entries may not be created. You should be careful when giving this privilege to a user because it may result in the server's disk being filled up with audit entries.

---

Before a user may access resources such as disks and printers on a server, you must have specified which resources you wish to share on the network. This is known as specifying network access information.

Once you have specified network access information for a resource, you will not need to specify it again. You may at any time, however, modify or delete the network access information.

LANtastic currently supports three classes of shared resources:

- Disks or directories
- Printers
- Mail

Although mail is not a physical resource such as a disk or printer, it is manipulated similarly to other network resources.

All network resources contain at least the following information:

- A name
- A linked path
- A description
- An access control list (ACL)

Every resource has a **unique name** on a server, although multiple servers may have the same resource name. You will use the resource name when attempting to access the resource from the network.

The **linked path** specifies the way the resource is referenced on the server. For example, the link path may contain a disk designator (C:), a printer name (LPT1), or a directory name (C:\DOS).

You may also create a **description** for the shared resources. The description will help remote users to better understand what the shared resource is all about.

An **access control list (ACL)** is associated with each network resource. The ACL specifies the level of access for any logged in user to the resource. When network access information is first created for a resource, its ACL is precreated to allow all users full access.

## **SPECIFYING NETWORK ACCESS INFORMATION**

## CREATING NEW SHARED RESOURCES

To create a shared resource select "Network access information" from the "Main functions" menu. A screen similar to the following will appear:

Directories/devices	=> Links
.	=>C:\LANTASTI.NET
ROOT	=>C:
RPPS	=>C:\PROGS\APPS
FLOPPY_A	=>A:
FLOPPY_B	=>B:
@PRINTER	=>LPT1
@MAIL	=>MAIL

The "Directories/devices" column represents the shared resources. This is the name the user will see across the network. The "Links" column represents the linked path to the shared resource. If you are creating a shared resource for the first time, only the "." will appear in the "Directories/devices" column. The "." entry is special in that it may never be deleted. It always references the network control directory. All shared resources are contained within the network control directory.

To add a new shared resource, press Ins. The following menu will appear:

Enter the name of the link directory or @Device

---

You may enter any valid filename for the resource name. Examples would be, ROOT, LOTUS, AUTOCAD, WP, WS, 123. If the filename begins with an "@", then it denotes a special resource device such as mail or a printer. The resource name @MAIL represents the mail system mailbox. If you want to create a system mailbox, specify @MAIL. You may use any name when specifying a printer but it must be preceded by "@".

Once you have entered the shared resource name, the menu will list the resource name on the left side of the screen without any link. To specify link information and other network access information for a shared resource, select the resource for modification.

## MODIFYING EXISTING SHARED DISKS OR DIRECTORIES

To select an existing shared disk or directory for modification, select the disk or directory name and press Enter. A menu similar to the following will appear:

Press enter to modify

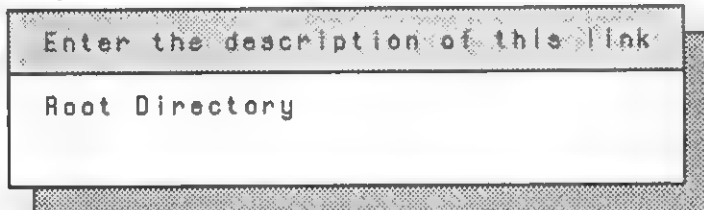
Description	
Link path	
CD-ROM Drive	
Access Control	

Link/ACL for ROOT

Description:	Main Root path
Link path:	C:
CD-ROM Drive:	No
ACCESS CONTROL	
GUEST	A---L---E--
\$*	RWCHLDKNER-
*	-----

To modify or enter a particular item, select the item on the left menu and press enter. The right menu contains the current network access information for the resource. The "Description" and "ACCESS CONTROL" items may not be fully displayed. You can see them in their entirety by selecting the corresponding item in the left menu.

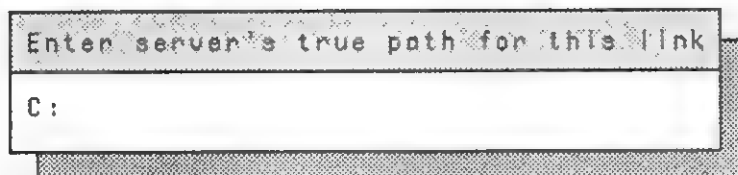
To modify the description, select "Description" in the left menu and press Enter. The following menu will appear:



```
Enter the description of this link
Root Directory
```

If you are entering a description for the first time, simply enter the description for the shared resource. If you have previously entered a description, the current description is displayed. You can edit or change the description. The description is optional.

To modify or create a resource's link path, select "Link Path" in the left menu and press Enter. You will see a menu similar to the following:



```
Enter server's true path for this link
C:
```

You should enter the disk or directory to which this resource is linked on the server. The user will not see this information. Some sample disks and directories are:

- |                |                  |
|----------------|------------------|
| A:             | shared floppy    |
| C:             | shared disk      |
| D:             | shared disk      |
| A:\SCRATCH     | shared directory |
| C:\DOS         | shared directory |
| C:\EDITORS\WP  | shared directory |
| D:\ACCOUNTS    | shared directory |
| D:\ACCOUNTS\MS | shared directory |

You may change the linked name at any time, even when the server is running. Although the network access information is changed immediately, the change may not take effect immediately due to server caching of network access information.

If the shared disk or directory is a CD-ROM drive, this **must** be specified. Failure to correctly specify a disk or directory as a CD-ROM drive may cause accesses to the CD-ROM drive not to work. In particular, if you are using the High Sierra Group (HSG) format with the Microsoft CD-ROM extension software (MSCDEX.EXE), you must specify that you have a CD-ROM drive.

To toggle CD-ROM drive selection between Yes and No, select "CD-ROM Drive" in the left menu and press Enter.

If you use MSCDEX.EXE with your CD-ROM, see Chapter 7, "Starting the LANtastic Network", for the proper order in which to bring up software.

## MODIFYING DESCRIPTION

## MODIFYING DISK OR DIRECTORY LINK PATH

## SPECIFYING CD-ROM DRIVE

## SPECIFYING ACCESS CONTROL

Every user has full access to a shared resource when it is first created. In order to provide better network security, you may decide to limit a user's access to a resource.

LANtastic provides an access control list (ACL) mechanism for every network resource which controls the level of access of a given user. You can allow or deny access by specific users or group of users.

Each type of access is denoted by a single letter. The access types are enumerated below.

**R - Read Access.**

User can open a file for reading.

**W - Write Access.**

User can open a file for writing.

**C - Create File.**

User can only create a NEW file. If Write (W) is also on, a user can create and overwrite an existing file.

**M - Make Directory.**

User can create a new subdirectory.

**L - Allow File Lookups (DIR's).**

User can display/search a directory or subdirectory. L access also allows a user to lookup the descriptive text for a shared resource.

**D - Delete Files.**

User can delete a file.

**K - Kill Directories.**

User can remove/delete a subdirectory.

**N - Rename Files.**

User can rename a file to a new name.

**E - Allow Program Execution.**

User has the right to execute a program. Some applications, like Microsoft Windows, do not "Execute" programs. Windows reads a program into memory and does not perform a DOS Exec system call. In this case, you must give the user read access to run programs. COMMAND.COM uses the Exec system call.

**A - Allow file Attributes to be changed.**

A user can change attributes for files in the shared directory. File attribute lookups are controlled by L access.

**P - Allow Physical Access to Devices.**

Allow the user to connect to DOS devices directly and not through the spooler. This can result in the remote system waiting a long time for a printer or modem request. During these times, network requests and local requests can be suspended.

**Warning! Do not normally set this ACL.**

An access control list (ACL) is a list of username templates and their appropriate access rights. A username template consists of a username or a partial username

followed by an asterisk (\*). The asterisk denotes that any number of characters may follow. For example:

```
ADMIN-*      RWCMLDKNEA-
BETTY       ----L---E--
CARL        RW--L---E--
*
```

The first ACL, ADMIN-\*, specifies that any user with the first six letters "ADMIN-", such as ADMIN-BILL, would have full access to the server's shared resource that contains this ACL. BETTY can only perform directory lookups and execute files. Since BETTY can only execute programs, she can't copy them and take them home! CARL has the ability to read, write, lookup files and execute programs but not to delete or rename files. Everyone else is designated by the "\*" and only has access to look up files.

Whenever access to a resource and any of its subresources (e.g. subdirectories of a shared directory) is requested, the ACL is scanned for a match between the requesting user and the ACL. Scanning of the ACL is sequential. Scanning stops as soon as the username template matches the user requesting access. The corresponding access is given to the user requesting the resource.

The sequential scanning of the ACL has one interesting benefit. Since scanning stops on the first matching entry, you can place username templates in front of group templates, thereby creating an exception to the group template. For example:

```
$MANAGER     RWCMLDKNEA -
$SMITH       RWC - LD - NE --
$BEGINNER    -----
$*           RWC - L --- E --
*
```

Although the \$ group only has RWC-L—E— access, \$MANAGER has RWCMLDKNEA- access, \$SMITH has RWC-LD-NE— access and \$BEGINNER has no access. When \$MANAGER, \$SMITH or \$BEGINNER try to access this resource, their access would be determined prior to a match with \$\*.

To modify the access control list for a shared resource, select "Access control" in the left window. A menu similar to the following will appear:

Users/groups and their access control	
GUEST	R---L---E--
\$MANAGER	RWCMLDKNEA-
\$*	RWCMLD-NEA-
*	-----

You may insert, delete or modify an ACL entry in this menu. To delete an ACL entry, move to the entry you want deleted and press Del.

To insert an entry before a username that is already listed, move to the username

and press Ins. You will be prompted for a username:

Enter the user or group for this ACL

Here you can enter a username or a username template. The username is automatically created with full access rights, except P, will be listed prior to the username upon which you pressed Insert. If you don't want to give this user full access, you will need to remove some of the access rights.

To change the access rights for a user, position to the username you wish to change and press any of the access rights letters (RWCMLDKNEAP). Pressing these letters will cause the access right letter to toggle on or off.

In addition to toggling the access rights letters, four functions keys are available to assist you in creating ACLs. The function keys and their meanings are listed at the bottom of the ACL menu. The keys are:

- |           |  |
|-----------|--|
| <b>F1</b> | Save entire ACL list. You can save the entire ACL list including usernames and access. The ACL list is in memory for later recall. If you exit out of NET_MGR, the saved ACL list is lost. |
| <b>F2</b> | Restore entire ACL list. You can restore a previously saved ACL list. The restored ACL list will overwrite an existing ACL list.   |
| <b>F3</b> | Set full ACL access. The username you are currently positioned over is given full access (excluding P access).   |
| <b>F4</b> | Clear full ACL access. The username you are currently positioned over has all of its access privileges removed.  |

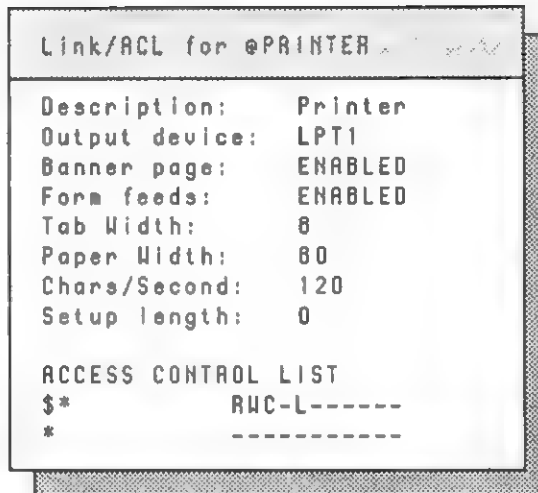
The save/restore (F1/F2) function key combination is very useful when you are creating multiple shared resources with the same or similar ACLs. For example, you would create a single shared resource and fully specify its ACL and press F1 to save the entire ACL. You would then create each additional shared resource, but rather than specifying the ACL for the resource you would press F2. This would have the effect of restoring the previously saved ACL in place of the current ACL.

The set/clear (F3/F4) function key combination is useful when you need to quickly allow or deny full access on a username basis.

---

When a shared printer resource is created, its link path is automatically made to reference LPT1. Although the shared resource is usable at this point, you will most likely want to add additional information about this resource.

Unlike a disk/directory resource, a printer resource has additional parameters which may be specified. To modify a shared printer resource, select the shared resource name and press Enter. A menu similar to the following will appear:

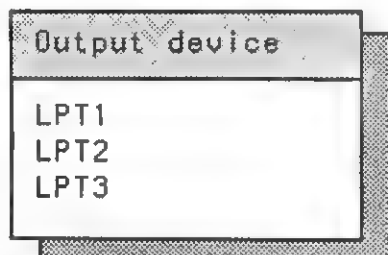


Modification of existing shared printer resources is similar to that of shared disk/directory resources as far as Description and Access control is concerned. To modify any of the printer resource information, select the item and press Enter.

To modify the description, select "Description" in the left menu and press Enter.

NOTE: See the "Modifying existing shared directories or disks" section for a detailed description of how to modify the Description.

To select the output device select "Output device" from the left menu and press Enter. A menu similar to the following will appear:



Select the printer port to which you want this shared printer connected. If you intend to output to a serial printer (COM port), you will still need to select a printer here. Before you bring up the network, however, you must run the MODE command to redirect output from the parallel printer to the serial printer. For example:

```

MODE COM1:9600,n,8,1,P      Sets baud rate, etc.
MODE LPT1:=COM1           Translates LPT1
                           To COM1
  
```

The above commands would initialize communications port COM1 for 9600 baud and redirect output from LPT1 to COM1. Refer to your DOS manual for more information on the MODE command.

You can enable the printing of a banner page before each print job. A banner page allows you to uniquely identify each printed job. To enable or disable the printing of a banner page, select "Banner" in the left menu and press Enter.

## MODIFYING DESCRIPTION

## SPECIFYING OUTPUT DEVICE

## SPECIFYING BANNER PAGE

A banner page consists of several fields:

- The username of who spooled the file for printing
- The machine where the user was logged into when he spooled the file
- Optional comments (usually the filename when you use the NET PRINT command)
- Date and time the file was printed
- Number of copies printed
- Other detailed information

## SPECIFYING FORM FEED

You can specify that a form feed (advance to top of form) be sent to the printer between each print job. To toggle between form feed ENABLED or DISABLED, select "Form feed" and press Enter.

Enabling form feeds is very convenient because you will not have to realign the paper between each print job. A form feed, however, is only sent at the end of a print job and not between multiple copies of a file being printed. Consequently, if you specify that you want 10 copies of a file to be printed, a form feed will be sent only after the last copy has printed.

## SPECIFYING TAB WIDTH

To enter the tab width, select "Tab width" and press Enter. The following menu will appear:



Enter tab stops (typically 8) or zero for no tabs

If your printer does not support tabs, then you would use this function to perform tab to spaces conversion while the print job is despooling. The typical value to enable tab expansion is 8. The value 0 assumes your printer will handle tabs.

## SPECIFYING PAPER WIDTH

If you want a banner page to be printed correctly, you must specify the paper width. The paper width is specified in number of characters that will fit on a single line. To specify the paper width, select "Paper width" and press Enter. The following menu appears:



Printer width in character positions

To compute the proper paper width, take the character density in characters per inch (CPI) and multiply it by the printing width of the paper in inches. For example, if the character density is 10cpi and the paper width is 8 inches (typical 8 1/2 X 11 paper), then the paper width in characters is 80.

Typical values for 8 1/2 inch wide paper are:

CPI	Paper width
10	80
12	96
15	120
17	132

The characters per second (CPS) option in the printer setup menu specifies the minimum number of CPS that will be output. This number only comes into play when there is contention for the CPU. If no one is using the server, then characters are always output as fast as the printer device can accept them, regardless of this setting.

To specify CPS, select "Chars/Second" and press Enter. The following menu appears:

```
Characters per second to be sent to printer
_____
```

The maximum value is 999. To avoid degradation, you may want to set the CPS no larger than about 500. This setting is used when there is contention between the user on the server and the printer. If the user at the server is not executing anything, then the CPS setting has no effect and data is sent to the printer as fast as it can be handled.

Since CPS may be set to a different value for different printer resources, you can create different printer priorities for various users by creating different @PRINTER files with different ACLs. For example:

@FAST	240cps	Fast printing for \$* accounts
\$*	RWCL	
@SLOW	60cps	Slow printing for everyone
*	RWCL	

You may wish to initialize your printer before each print job. Different types of initialization that may be performed are to condense the print size, select draft mode, letter quality mode or initialize tabs. The type of printer setup that may be performed varies between printers. You should consult your printer manual for a list of printer codes for initializing the printer.

To specify a printer setup string, select "Setup string" and press Enter. The following menu will appear:

```
Printer setup string
1B <ESC>
30 "0"
1B <ESC>
30 "="
<<END of string>>
```

## SPECIFYING CHARACTERS PER SECOND

## DEFINING A PRINTER SETUP STRING

If you have not previously specified a printer setup string, the above menu would be blank. The printer codes displayed here are only examples and may not perform any functions on your printer.

You may enter up to 64 characters (codes) for a printer initialization string. You can use the cursor keys and the Ins and Del keys to create your own custom setup string. The setup string is sent sequentially to the printer **before** the banner page is printed.

Lets assume that your printer defines a code for compressed printing with an Escape followed by the character "H". You can press Ins to add the escape character to the setup string. You will then be asked for the character or the hex code (Escape is 1B):

Enter a two digit Hex number or a single character

The next character can be entered by pressing Ins and then typing the letter H.

For nondisplayable control characters the following textual representation is used:

00 NUL	01 SOH	02 STX	03 ETX	04 EOT
05 ENQ	06 ACK	07 BEL	08 BS	09 TAB
0A NL	0B VT	0C FF	0D CR	0E SO
0F SI	10 DLE	11 DC1	12 DC2	13 DC3
14 DC4	15 NAK	16 SYN	17 ETB	18 CAN
19 EM	1A SUB	1B ESC	1C FS	1D GS
1E RS	1F US	7F DEL		

Since you can have multiple @PRINTER resources pointing to the same physical printer (e.g. LPT1), you can create different printer resources with different setup strings. For example, you could make @DRAFT be high speed draft mode, @LQ be letter quality and @SMALL be condensed printing.

## SPECIFYING PRINTER ACCESS CONTROL

The default access control for a printer resource is RWCL because the additional access privileges are meaningless for printers. Since printers may only be written to, it would appear that Write (W) access is the only access that would be needed. Many programs, however, access printers in a variety of ways including attempting to create, read or lookup the printer. In order to accommodate these programs, you should set printer access to at least RWCL.

**NOTE:** See the "Modifying existing shared directories or disks" section for a detailed description of how to specify the access control.

## MODIFYING AN EXISTING MAILBOX

To select an existing mailbox for modification, select @MAIL and press Enter. The only information you can specify or change for @MAIL is its description and access control.

## MODIFYING DESCRIPTION

To modify the description, select "Description" in the left menu end press Enter.

**NOTE:** See the "Modifying existing shared directories or disks" section for a detailed description of how to modify the Description.

The default access control for the @MAIL mailbox is RWCL.

## SPECIFYING MAIL ACCESS CONTROL

You can specify access control information for various users to disallow their ability to send mail. They can, however, still receive mail. A sample ACL for @MAIL might look like:

```
JOHN      —
MARY      —
*         RWCL
```

John and Mary could receive mail but could not send mail. All other users can send and receive mail.

NOTE: See the "Modifying existing shared directories or disks" section for a detailed description of how to specify the access control.

The server startup parameters are special server customizing options which take effect whenever the server is started. The options fall into the following categories:

- Resource usage
- Number of adapters
- Initial despooler state
- Auditing level

Resource usage deals with the number of anticipated users of the server, server buffer space allocation and the availability of the removable media for formatting.

Number of adapters enumerates network adapters installed on your server.

Initial despooler state allows you to specify whether the despooler is automatically started when the server is booted.

Audit level deals with the type of audit entries the server should record.

You do not need to specify any server startup parameters to initially start the network. You may change the server startup parameters when the network is running, but the changes won't take effect until the server is rebooted.

To change any of the server server startup parameters, select "Server startup parameters" in the "Main functions" menu. You will see a screen similar to the following:

Press Enter to modify	Server installation window
Maximum users	Maximum users 120
Network buffer	Network buffer 10240 bytes
Maximum adapters	Maximum adapters 1
Network tasks	Network Tasks 31
Floppy direct	Floppy direct ENABLED
Despooling	Despooling DISABLED
Audit server up	AUDITING
Audit logins	Server up DISABLED
Audit logouts	Logins DISABLED
Audit queuing	Logouts DISABLED
Audit printing	Queuing DISABLED
Audit user entries	Printing DISABLED
Access allowed	User Entries DISABLED
Access denied	Access allowed -----
	Access denied -----

## SERVER STARTUP PARAMETERS

## MAXIMUM USERS

To change any of the server startup parameters you will need to select the corresponding parameter on the left menu. The following sections explain each of the parameters in detail.

You can specify the maximum number of users that can be logged into a server simultaneously. The more users you specify, the more memory the server will require. If you are installing LANtastic NOS for the first time, the default number of logins is set to eight.

To change the maximum number of logged in users, select "Maximum users" and press Enter. The following menu will appear:

```
Enter maximum simultaneous logged in users (2-120)

```

You may want to restrict the number of simultaneous users of a server since the more people who are using the server, the slower the local response.

## NETWORK BUFFER

You can change the size of the buffer that the server uses for network communication. Although performance will be enhanced with larger buffers, more memory is required when larger buffers are specified.

To specify the network buffer size, select "Network buffer" and press Enter. You will see the following menu:

```
Select size
2048 Bytes
4096 Bytes
6144 Bytes
8192 Bytes
10240 Bytes
12288 Bytes
14336 Bytes
16384 Bytes

```

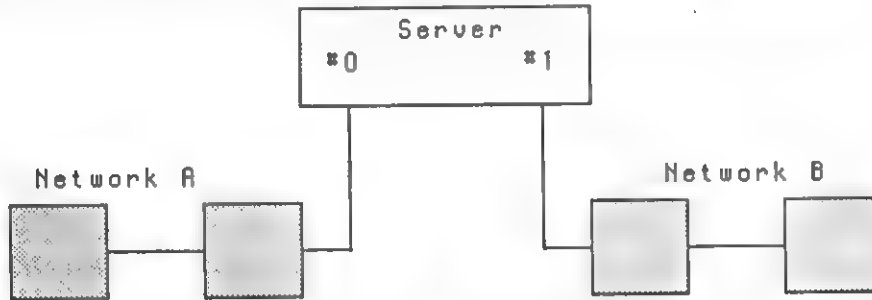
Specifying a large buffer will increase network performance but may decrease response time while working on the server computer. Specifying a smaller buffer size will delay response time on the network and may improve response time on the server computer. If you are planning to dedicate a server or use it infrequently, you should choose a large value for the network's buffer size.

The default value of 4096 has been chosen to give adequate network performance while using very little memory. If you are extremely short of memory, you could choose an even smaller buffer size.

In conjunction with LANtastic hardware, the network operating system takes advantage of the processor in the network adapter and overlaps disk reads and writes with network traffic to give you improved performance with smaller buffers.

Normally, you will only have a single NETBIOS adapter in a server. You may, however, install up to four NETBIOS adapters in a server. Each NETBIOS adapter can then service an independent network. The server will be a central focal point for each network.

The server will not automatically bridge NETBIOS requests across different adapters. This means you will not be able to log into a server on a different network. For example, the server below has two NETBIOS adapters (#0 and #1). Each adapter services two independent networks.



Although the server is part of both networks (A and B), users on network A may not login to servers on network B or visa versa. Users on both networks may, of course, login to the common server.

To specify the number of adapters you have in your server, select "Maximum Adapters" and press Enter. You will get the following menu:



You will need to consult your hardware user's manual as to how to physically connect multiple adapters. The LANtastic network software requires that each NETBIOS adapter be sequentially numbered. For example, if you had three adapters connected to your server, they would have adapter numbers 0, 1 and 2.

If you specify more adapters than you actually have in your server, you will receive an error message when the server is started.

If you are installing LANtastic for the first time, the default number of adapters is set to one.

The network tasks parameter allows the server to concurrently process several network requests. The more network tasks you specify, the more concurrent requests the server can handle. Because each network task requires a network buffer, you may run out of memory when you specify a large number of tasks. In that case, you should reduce the number of tasks or the network buffer size.

The default number of network tasks is one. This number will be sufficient for most applications. If you have more than one adapter installed in the server, you may want to increase the number of network tasks. You should allocate a network task for each adapter you have installed in your server.

## MAXIMUM ADAPTERS

## NETWORK TASKS

You may also want to increase the number of network tasks if there will be multiple logged in users. In general, set the number of network tasks to :

$$(1/4 * \text{number of users}) + 1$$

If you have multiple adapters and multiple logged in users, then you can use the following formula to compute the maximum number of tasks:

$$\text{number of adapters} + (1/4 * \text{number of users}) + 1$$

## FLOPPY DIRECT

---

### FLOPPY DIRECT      Default: ENABLED

This option allows you to either enable or disable floppy direct access. Select "Floppy direct" and press Enter to toggle between ENABLED and DISABLED.

When floppy direct access is enabled, a user on the server may FORMAT and CHKDSK floppy disks. When floppy direct access is disabled, floppies may not be formatted. If you enable direct access and the floppy is shared on the network, it is up to you to make sure that no one formats a floppy at the same time it is being accessed across the network by a user.

## DESPOOLING

---

### DESPOOLING      Default: DISABLED

This option allows you to enable or disable despooling when the server is first started. Select "Despooling" and press Enter to toggle between ENABLED and DISABLED.

When despooling is enabled, entries in the print queue begin printing as soon as the server is started. When despooling is disabled, entries in the print queue are not printed until despooling is started by a Start or One-Job command in the NET program or by a NET QUEUE START command.

You will want despooling DISABLED if:

- You have not created any shared printer resources.
- You are planning to manually start each print job and do not want print jobs to automatically begin printing.

You will want despooling ENABLED if:

- You have created a shared printer resource.
- You want printing to begin automatically whenever a job is placed in the print queue.

**NOTE:** Please refer to Chapter 10, "Network Printing" and Chapter 8, "NET Menu", for more information about despooling.

## SPECIFYING AUDITING

---

Auditing allows you to see the various kinds of accesses that were performed on a server. With this information, you can determine:

- The amount of server resources that were used by individual users.
- The files that were accessed.
- The files that were queued.
- The files that were printed.
- Any unauthorized access to the server.

You may specify several types of auditing. Some audit types are either enabled or

disabled completely; other audit types are enabled to certain levels of auditing.  
NOTE: Refer to the "Audit trail maintenance" section when trying to interpret audit trail information.

Each audit level that you can specify is described below.

**AUDIT SERVER UP** **DEFAULT: DISABLED**

To toggle this entry between ENABLED and DISABLED select "Audit Server Up" and press Enter. Enabling this option creates an audit entry whenever the server is started or shutdown.

**AUDIT LOGINS** **DEFAULT: DISABLED**

To toggle this entry between ENABLED and DISABLED, select "Audit Logins" and press Enter. Enabling this option creates an audit entry whenever a user logs into the server.

**AUDIT LOGOUTS** **DEFAULT: DISABLED**

To toggle this entry between ENABLED and DISABLED, select "Audit Logouts" and press Enter. Enabling this option creates an audit entry whenever a user logs off from the server.

**AUDIT QUEUING** **DEFAULT: DISABLED**

To toggle this entry between ENABLED and DISABLED, select "Audit Queuing" and press Enter. Enabling this option creates an audit entry whenever anyone places an entry into the server's queue. This includes both mail and print queue entries. Placing an entry in the queue is different from printing an entry from the queue (see Audit Printing below).

**AUDIT PRINTING** **DEFAULT: DISABLED**

To toggle this entry between ENABLED and DISABLED, select "Audit Printing" and press Enter. Enabling this option creates an audit entry whenever a print job finishes printing.

**AUDIT USER ENTRIES** **DEFAULT: DISABLED**

To toggle this entry between ENABLED and DISABLED, select "Audit user entries" and press Enter. Enabling this option creates an audit entry whenever a user issues a NET AUDIT command. Disabling this option still allows NET AUDIT commands to occur, but no user entries are audited.

**ACCESS ALLOWED** **DEFAULT: - - - - -**

This option allows you to specify auditing whenever access is ALLOWED on the server. You may specify the level of auditing to be performed by pressing the appropriate access control letters. For example, if you want to audit whenever someone is allowed to read or write a file you would select the R and W access rights.

If no access control letters are shown (—————), access allowed auditing is disabled.

**ACCESS DENIED** **DEFAULT: - - - - -**

This option allows you to specify auditing whenever access is DENIED on the server. You may specify the level of auditing to be performed by pressing the appropriate access control letters. For example, if you want to audit whenever a user is denied access when deleting a file or directory, you would select the D and the K access control letters.

If no access control letters are shown (—————), access denied auditing is disabled.

## AUDIT TRAIL MAINTENANCE

The audit file contains entries corresponding to enabled audit options. The audit options are enabled in the Server Startup menu. You may view, copy, or initialize the audit file.

New log information is always added to the end of the log file. If you have no need for the log information, you can clear the log file. It will be recreated whenever a new log entry is written.

Although the log file is currently maintained in a human readable form, it may not be in future versions of LANtastic NOS. Consequently, if you wish to examine the log file you should either choose "View last few audit entries" or "Copy audit trail to file" and then examine the copy. Note: If you examine the audit file directly, you may lose some log entries.

### VIEWING LAST FEW AUDIT ENTRIES

Selecting "View", displays the last few entries in the audit file. This is useful when you want to see current server audit activity. To view the last few audit entries, select "View last few audit entries" and press Enter.

The viewed audit trail is a snapshot of the server audit activity and is not refreshed unless you exit this menu and reenter. Some audit entries are too long to display and occupy two lines of the display.

NOTE: See the Audit Trail File Format section for a description of each of the audit trail entries.

### COPYING THE AUDIT TRAIL TO A FILE

If you need to use the audit file to sort its entries or process the data, you must copy it to another file and then process the data. You can also use this command to make copies of the audit trail file before it is cleared.

### CLEARING THE AUDIT FILE

If you no longer need to keep any of the audit trail information, you can use this command to clear the file. When new audit information is added, a new audit trail file will be created. The audit trail is typically cleared after it has been copied to a file.

### THE AUDIT TRAIL FILE FORMAT

The format of each audit entry is:

T YY.MM.DD HH:MM:SS USERNAME MACHINE-NAME REASON VARIABLE<cr><lf>

T	Denotes the type of entry. Valid types are *,I, I, O, A, D, Q, S, U.
YY.MM.DD	The year, month and day of the log entry.
HH:MM:SS	The hour, minutes and seconds of the audit entry.
USERNAME	The username to which the audit entry corresponds.
MACHINE	The machine name from which the user logged in.
REASON	A reason for the entry.
VARIABLE	More specific variable length information.
<cr><lf>	Carriage return linefeed line terminators.

### THE AUDIT ENTRY TYPES

Each audit entry may be classified into nine audit entry types. Each audit entry type may be selectively enabled when the server is started. A description of each of the audit entry types follows, along with a more detailed description of each of the fields.

*	This audit entry is written whenever the server is first started.
YY.MM.DD	The date the server was started.
HH.MM.SS	The time the server was started.
USERNAME	not used

MACHINE not used  
 REASON not used  
 VARIABLE Four fields are present:  
 •The command line the server was started with.  
 •The auditing level that the server was started with.  
 The characters \*!IOSU represent the corresponding audit type that was enabled in the server startup menu.  
 •The denied access control letters that were selected in the server startup menu.  
 •The allowed access control letters that were selected in the server startup menu.

I This audit entry is created when the server is shut down.

YY.MM.DD The date the server shut down.  
 HH.MM.SS The time the server shut down.  
 USERNAME Not used  
 MACHINE Not used  
 REASON Not used  
 VARIABLE Not used

I This audit entry is written whenever a user successfully logs into the server.

YY.MM.DD The date the user logged in.  
 HH.MM.SS The time the user logged in.  
 USERNAME The username of the user who logged in.  
 MACHINE The remote machine they logged in from.  
 REASON The privileges the user had when logging in.  
 VARIABLE not used

O This audit entry is written whenever a user logs off the server or the server connection to the user is broken.

YY.MM.DD The date the user logged off.  
 HH.MM.SS The time the user logged off.  
 USERNAME The username of the user who logged off.  
 MACHINE The machine they logged off from.  
 REASON The logout reasons are:  
 NORMAL -- Normal user initiated logout.  
 DISCON -- Logout due to remote node disconnecting.  
 SHUTDOWN -- Automatic logout due to server shutdown.  
 TERM -- The user login was terminated by a privileged user.  
 TIMEOUT -- The user was logged out because his allocated time on the server had expired.

VARIABLE Two numbers are placed in this field. The first number is the number of IO requests that were performed on the server. The number is in Kbytes (1K=1024). The second number is the number of server requests that were performed. Operations such as looking up a file, reading data, writing data, locking a file region, etc. are all server operations. Refer to the "Displaying server activity" section in the NET menu chapter for a list of server operations.

A This entry is written whenever access is allowed to a shared resource.

YY.MM.DD The date access was allowed.  
 HH.MM.SS The time access was allowed.  
 USERNAME The username which was allowed access.  
 MACHINE The machine the user was logged into.  
 REASON The type of access allowed as ACL characters (e.g W for write access.) The type of access that is audited is

	specified in the server startup menu.
VARIABLE	The network path relative to the network control directory which access was granted to.
<b>D</b>	This entry is written whenever access is denied to a shared resource.
YY.MM.DD	The date access was denied.
HH.MM.SS	The time access was denied.
USERNAME	The username which was denied access.
MACHINE	The machine the user was logged into.
REASON	The type of access denied as ACL characters (e.g. D for delete access.) The type of access that is audited in specified in the server startup menu.
VARIABLE	The network path relative to the network control directory in which access was denied.
<b>Q</b>	This entry is written whenever an entry is placed in the queue. Both mail and print entries are written to the audit file.
YY.MM.DD	The date an entry was placed in the queue.
HH.MM.SS	The time an entry was placed in the queue.
USERNAME	The user that placed and entry in the queue.
MACHINE	The machine the user was logged into at the time the queue entry was made.
REASON	The destination where the file was queued to. For example, @PRINT or the username if mail was being sent.
VARIABLE	The number of bytes that the queue entry occupies in the queue.
<b>S</b>	This entry is written whenever a queue entry is despoiled to a printer. The entry is only written after the file has been printed.
YY.MM.DD	The date the file finished despooling.
HH.MM.SS	The time the file finished despooling.
USERNAME	The user the file was despoiled for.
MACHINE	The machine the user was logged into at the time the queue entry was made.
REASON	The destination of the despoiled file (e.g. @PRINTER).
VARIABLE	Total number of bytes that was output by the despooler. This includes the bytes that were used to generate the banner page.
<b>U</b>	This entry is written whenever a user requests to write an audit entry. Usually with a NET AUDIT command.
YY.MM.DD	The date the audit entry was written.
HH.MM.SS	The time the audit entry was written.
USERNAME	The user who wrote the queue entry.
MACHINE	The machine the user was logged into.
REASON	Filled in by the user who made the audit entry.
VARIABLE	Filled in by the user who made the audit entry.

## SAMPLE AUDIT FILE

An excerpt from an actual audit file is shown on the following page. Some of the fields have been shortened to allow easy reproduction in this manual. The server was started with full auditing. It is not recommended that you run the server in this mode, since the resulting audit file may be enormous.

```

*      87.12.14      20:19:59      \NC - *IOQSURWCMLDKNEP
      \RWCMLDKNEP
I      87.12.14      20:20:33      ALEX      AT      AQ
A      87.12.14      20:20:41      ALEX      AT      L      \ROOT
A      87.12.14      20:21:17      ALEX      AT      L      \ROOT\TREE.???
A      87.12.14      20:21:17      ALEX      AT      L      \ROOT\DOSTREE???
A      87.12.14      20:21:17      ALEX      AT      E      \ROOT\DOSTREE.COM
A      87.12.14      20:21:18      ALEX      AT      L      \ROOT
A      87.12.14      20:21:19      ALEX      AT      L      \ROOT\?????????.???
A      87.12.14      20:21:19      ALEX      AT      L      \ROOT\?????????.???
A      87.12.14      20:21:19      ALEX      AT      L      \ROOT\ADA
A      87.12.14      20:21:19      ALEX      AT      L      \ROOT\ADA?????????.???
A      87.12.14      20:21:21      ALEX      AT      L      \ROOT\ADA?????????.???
A      87.12.14      20:21:31      ALEX      AT      R      \ROOT\AUTOEXEC.BAT
O      87.12.14      20:21:40      ALEX      AT      NORM  120 45
I      87.12.14      20:21:50      USERNAME AT
A      87.12.14      20:22:03      USERNAME AT      L      \DOS
A      87.12.14      20:22:08      USERNAME AT      R      \DOS\HELLO
D      87.12.14      20:22:08      USERNAME AT      WC      \DOS\HELLO
U      87.12.14      20:22:12      USERNAME AT      DONE  Done with sample
O      87.12.14      20:22:24      USERNAME AT      SHUT  30 12

```

## CHAPTER 7 STARTING THE LANtastic NETWORK

Before you start to use the LANtastic network you should have already installed the software and created at least one user account and shared resource on the server machine. To start the LANtastic network you will need to run the LANtastic Redirector and/or Server programs. If you want record and file locking support, you will need to run the DOS SHARE command.

You may also need to modify your CONFIG.SYS file before starting LANtastic. Please consult the "Your CONFIG.SYS file" section for more information about the CONFIG.SYS file and what modifications you need to make.

The LANtastic Redirector and Server programs are the heart of the LANtastic network operating system. The Redirector redirects network DOS requests across the network. The Server processes the requests. The Redirector program is called REDIR.EXE; the Server program is called SERVER.EXE.

This chapter familiarizes you with the programs that you need to run in order to bring up the LANtastic network.

---

The NETBIOS must be started with sufficient resources before LANtastic NOS will run. If you are installing a starter kit version of LANtastic (two users), then the default NETBIOS resources are sufficient. Generally, you will not have to alter the NETBIOS resources unless there will be more than six users logged into a server.

The NETBIOS resources that need to be increased are the default Network Command Blocks (NCBs) and the default Sessions. Normally, when the NETBIOS is started, the default NCBs is twelve and the default sessions is six. If you are using an ARTISOFT NETBIOS, then you will be able to change these defaults by using the NCBS= and SESSIONS= command line options. These options are specified when you type "LANBIOS". If you are using LANtastic NOS with another manufacturer's NETBIOS, consult that manufacturer's manual.

Sessions are established whenever a user logs into a server. One session is established on the workstation and another on the server. If the login is coming from a user at the server, then a total of two sessions will be established on the server. For every login, a corresponding NCB is also used on the server.

The required number of NETBIOS NCBs and sessions is therefore related to the maximum number of logins to a server. For example, if you wanted eight users to be able to log into the server, then you would need at least eight NCBs and eight sessions on the server.

LANtastic NOS and other NETBIOS applications will, however, use additional NCBs and sessions beyond the maximum number of logged in users. Consequently, you should set the NCBs and sessions to a number larger than the maximum number of logins. A good guideline is to set the default NCBs and sessions to eight more than the maximum logins.

---

The LANtastic networking software operates in any computer that is an IBM or true compatible. Unlike most other networks, LANtastic takes up very little memory. Typical network configurations require less than 10K for a workstation (redirector), and less than 40K for a full server (redirector and server). You will increase your memory requirements if you increase the buffer space that the network uses.

Although LANtastic will run on a floppy based server, it is recommended that you have a hard disk on your network server. Your workstations can also have hard disks, but generally all they need is a floppy. Although printer spooling and despooling is an integral part of the LANtastic server, you don't need a printer on

### NETBIOS REQUIREMENTS

### HARDWARE REQUIREMENTS

## WHICH DOS VERSION TO USE

## RUNNING THE REDIRECTOR

your server.

The LANtastic network operating system will run with any NETBIOS compatible hardware. You must be selective when choosing NETBIOS compatible hardware because not all NETBIOS interfaces are truly NETBIOS standard.

---

Because network support was not available until DOS version 3.1, LANtastic only runs with DOS version 3.1 and above. You will need to upgrade to a newer version if you are running DOS versions 1.0 or 2.1. **Due to software problems in version 3.2 of DOS, you may need to install software patches in order to run the network reliably. It is strongly recommended that you use DOS version 3.1 or 3.3 to avoid these problems.**

---

The Redirector (REDIR.EXE) must be run after the NETBIOS interface is installed. If you are using LANtastic hardware, this would be after running LANBIOS. It must also be run before the Server (SERVER.EXE). You must run these programs in the proper sequence, REDIR then SERVER.

The syntax for starting the Redirector program is:

### REDIR machine-name options

where

**machine-name**

is the name by which your computer will be known on the network. This name must be unique or you will get an error message and the Redirector will not be installed. If you run the Server program on this same computer, then this will also be your server's machine name. And where,

### options

Are optional parameters which control the Redirector configuration. You will usually omit these options. Should you specify options, the format is:

**name=value or name:value.**

The following list enumerates each of the allowable REDIR options. Values in [ ] are the default values, when no option is given. Values after the [ ] are the allowable range that you may specify when running REDIR.

#### OPTION: BUFFERS=[1] 1-64

Allows you to specify the number of read/write/lookup buffers the Redirector keeps. See the "Redirector Buffers" section for more information on using this option.

#### OPTION: SIZE=[1024] 512-16384

Allows you to specify the byte size of each of the read/write/lookup buffers the Redirector uses. The total buffer size (BUFFERS\*SIZE) may not exceed 32K bytes. See the "Redirector Buffers" section for more information on using this option.

#### OPTION: LOGINS=[2] 1-255

Number of remote computers that this computer can log into. Note that this has nothing to do with the maximum number of logins that a server will allow. If you intend to login to more than 2 servers from your Redirector, then you need to

increase this value.

For example,

#### **REDIR BIG-AT**

would bring up the Redirector using all default option values. You will generally bring up the Redirector this way.

Whereas,

#### **REDIR REMOTE-PC BUFFERS=2 SIZE=2048 LOGINS=4**

would bring up the Redirector with machine name REMOTE-PC, with two buffers of size 2048 bytes each (total 4096 bytes) to be used for reads, writes, or lookups and the ability to login to only 4 servers.

Finally,

#### **REDIR PC-DEMO SIZE=4096**

would bring up the Redirector with machine name PC-DEMO, one buffer (the default) of 4096 bytes to be used for reads, writes, or lookups and the ability to login to 2 servers (the default).

If the Redirector fails to run, it will display an error message. You should consult Chapter 13 for a list of error messages. If you are running REDIR from a batch file, you may also test the returned error level.

The following is a list of error level codes which are returned by REDIR:

- 0 - No error - redirector installed OK
- 1 - Wrong DOS version
- 2 - NETBIOS not present
- 3 - Other Redirector installed
- 4 - No machine name on command line
- 5 - Bad SIZE= option value
- 6 - Bad BUFFERS= option value
- 7 - Bad total size (SIZE\*BUFFERS >32K)
- 8 - Bad LOGINS= option value
- 9 - Machine name in use on network

---

The Redirector maintains a set of internal buffers. You can specify the number of buffers and their size with the BUFFERS= and SIZE= options. In this section you will learn how buffers work and how to determine the correct buffer size.

**NOTE:** You will not need to specify any buffers or buffer sizes when you bring up the network for the first time. The defaults are generally sufficient for most applications.

Many programs read and write small pieces of data at one time. If this data resides across the network, then a network request is made for each piece of data. Buffers allow the grouping of data into larger chunks so that requests are made in multiples of the buffer size. This allows the Redirector to read a large piece of data and then give a small piece of the data to the program when requested. This reduces the number of network requests and thus improves throughput.

## **REDIRECTOR BUFFERS**

For example, if a program is reading 8 bytes at a time, it would make 64 network requests to read 512 bytes. But with a 512 byte buffer, the program would only generate 1 network request. Although the speed improvement is not 64 times, it is significant.

The Redirector also uses the buffers to store data that is to be written across the network. When a buffer fills up, the entire buffer is written across the network.

You may vary the number and the size of buffers you have in the Redirector. The default is one buffer of size 1024 bytes. Most pre-network type programs will benefit from a larger buffer size. However, having more buffers will not necessarily improve network performance. The number of buffers should be chosen such that it corresponds to the number of simultaneous open files.

There are a few cases when buffering cannot be done. This occurs when a program opens a file in a network sharing mode. Usually these types of programs have been designed to work in multiuser or network environment and buffering would cause the programs to not work correctly. LANtastic NOS automatically detects this type of access and disables buffering.

A general guideline for improving performance by using buffers is not possible. You should try different combinations of buffer size and number of buffers. If your programs do not open many files at one time, then having a large number of buffers will not help. Increasing the buffer size would probably be more beneficial in that case.

The buffers are also used to buffer printer data. If a program sends a large amount of data to a printer, then increasing the buffer size may improve the program's performance.

Although directory lookups are also buffered, changing the buffer size or the number of buffers will not effect directory lookup performance. Increasing the number of buffers, however, may improve performance when reads or writes are contending with directory lookups for buffer resources.

## RUNNING THE SERVER

---

Before you run the Server program, make sure that you have run NET\_MGR and created at least one user account and shared directory resource. The Server will run even if you have not done this, but the server will not be accessible for remote logins.

The Server (SERVER.EXE) is run after the Redirector (REDIR.EXE). If you have Microsoft CD-ROM extension software, it will need to be run before bringing up the Server. See the "When to run CD-ROM extension software" section for more information.

The syntax for running the Server is:

**SERVER [control-directory]**

where

**control-directory**

is an optional control directory path. If the control directory is not specified, the default argument is \LANTASTI.NET. You will rarely specify the control-directory path.

For more information about this argument and when you would need to specify it,

see Chapter 12 "Advanced Topics".

For example,

## **SERVER**

will bring up the server.

If the server fails to start, it will display an error message. You should consult Chapter 13 for a list of error messages. If you are running SERVER from a batch file, you may also test the returned error level. The following is a list of error level codes which are returned by SERVER:

- 0 - No error - server installed OK
- 1 - No redirector installed
- 2 - Server already installed
- 3 - Bad control directory
- 4 - No server configuration file found
- 5 - Bad server configuration file
- 6 - No spool control file found
- 7 - PRINT already running
- 8 - Bad NETBIOS
- 9 - Not enough memory
- 10 - REDIR version does not match SERVER version
- 11 - Insufficient NETBIOS resources
- 12 - NETBIOS adapter not present

---

The DOS SHARE program implements record and file locking and also prevents simultaneous access to files by different users on the network.. SHARE should be run on each server but is not needed on nodes. Typically, SHARE is put into the server's AUTOEXEC.BAT file.

You may run SHARE at any time, but it is recommended that you run it before bringing up the network.

For more information about SHARE consult your DOS manual.

---

The FASTOPEN program speeds up file opens and is available with DOS version 3.3. FASTOPEN only needs to be run on your server. In most cases, running this program will improve server performance. You can run FASTOPEN at any time, but it is recommended that you run it before bringing up the network.

For more information about FASTOPEN consult your DOS manual.

---

The CONFIG.SYS file is a standard DOS file which DOS uses when it first boots up. This file contains information about your computer configuration. When you install a network, you may need to modify CONFIG.SYS to more accurately reflect your new configuration.

LANTastic NOS will run even if you haven't modified your CONFIG.SYS file. However, you should still be familiar with the different CONFIG.SYS options. In this section, only the CONFIG.SYS options which are relevant to networking will be covered. Although these options have uses other than in networking, we will only concern ourselves with network applications.

For non-network uses consult your DOS manual.

## **RUNNING DOS SHARE**

## **RUNNING DOS FASTOPEN**

## **YOUR CONFIG.SYS FILE**

Each option in the CONFIG.SYS file is a text line. You can use any text editor to modify the CONFIG.SYS file. Options related to networking that are covered in this section are:

**LASTDRIVE=n**  
**FILES=n**  
**FCBS=m,n**  
**BUFFERS=n**

**LASTDRIVE=n**

The LASTDRIVE=n option instructs DOS to allocate more internal disk drive tables. You should use this option to increase the number of available network drives. If you omit LASTDRIVE=n, then the last available drive is E:.

You will use these extra available drives to connect to shared network drives and directories. Although you can overwrite your existing drive connections, it is preferable to use the drives created with the LASTDRIVE command.

The LASTDRIVE= option should be placed in the CONFIG.SYS file of any computer that wants to extend its drives, usually the workstations.

For example,

**LASTDRIVE=K**

would allocate drive letters all the way up to K.

**FILES=n**

The FILES=n option instructs DOS to allocate sufficient internal file storage to support up to "n" concurrently open files. You will usually use this option on your server since your server opens files on behalf of remote nodes. The largest number you can set for this option is 255.

Every file opened locally by the server, and every file opened by a remote node on the server, counts as an open file. You should generally allocate at least 50 files plus a minimum of 5 files per logged in user.

For example,

**FILES=50**

**FCBS=m,n**

The FCBS=m,n option instructs DOS to allocate sufficient internal file storage for old-style file control blocks (FCBS). The value "m" is the maximum number of FCBS to allocate. The value "n" is the number of FCBS to protect against automatic closing. You will need this option if you have programs which use FCBS. The option must be present in the CONFIG.SYS file on the machine where you are running the program.

You will need to add this option to your CONFIG.SYS file if you get the following critical error message when running a program:

**FCB unavailable**  
**Abort, Retry, Ignore?**

A general value for FCBS= is FCBS=16,8.

## **BUFFERS=n**

The **BUFFERS=n** option instructs DOS to allocate internal buffers for storing frequently accessed data. This option primarily affects a server's configuration. If you intend to run disk caching software, you should set this value low. If you are not running disk caching software, then you should set this value high. If you have a fast 286 or 386 type machine, then you may want to set this value to its maximum of 99.

For example,

## **BUFFERS=99**

CD-ROM drives are accessible through the LANtastic network. Various CD-ROM formats and software drivers exist. If your CD-ROM software is only installed by a **device=** line in the CONFIG.SYS file then you can bring up the network normally.

If you have additional software that must be run in order to make your CD-ROM drive accessible, then you should run the CD-ROM software after bringing up REDIR but before running SERVER.

A very popular CD-ROM format is the High Sierra Group (HSG). Usually a CD-ROM manufacturer will supply Microsoft's CD-ROM extension software (MSCDEX.EXE) with the CD-ROM drive. This software allows you to read HSG formatted CDs. You should run MSCDEX.EXE after REDIR but before SERVER.

For example,

### **REDIR host**

```
MSCDEX /d:MSCD000 /m:10  
SERVER
```

This will be contrary to the CD-ROM manufacturer's documentation which states that you should run the CD-ROM software after bringing up the network. With LANtastic, you must start the CD-ROM software after the Redirector but before the Server.

**Because someone may be using your server remotely, you should never just turn off the server or press the reset button.** If you need to reboot your server, first press Ctrl-Alt-Del. LANtastic intercepts this reboot keystroke sequence and overlays the following menu on your screen:

```
lll Active logins   fff Open network files  
PRESS             S   To shutdown the server  
   Ctrl-Alt-Del   To reboot immediately  
   Other Keys     To continue
```

where "lll" is the number of users currently logged into your server and "fff" is the number of files opened through the network on your server.

You will also get two quick beeps if the active logins or open network files are non-zero. These beeps are intended to draw your attention to the fact that someone is still using the server.

Before LANtastic will accept any keystrokes, you must release your fingers from the Ctrl-Alt-Del keys. This is a built-in safety precaution to prevent accidental reboot due to the keyboard typematic action.

## **WHEN TO RUN CD-ROM EXTENSION SOFTWARE**

## **REBOOTING THE SERVER**

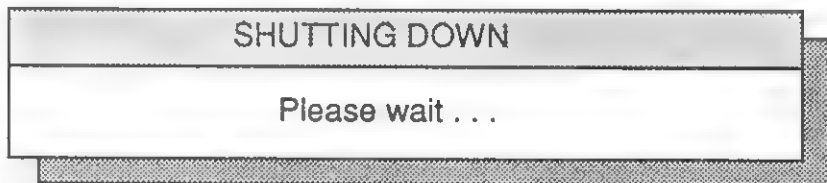
You should always choose the S option to shut the server down. This option logs all users off the server, closes any open files and halts the server gracefully. If you really want to reboot without closing any open files you can press Ctrl-Alt-Del again.

If you don't want to shut the server down or reboot, then press any other key. You will be placed back in your program.

While the above menu is being displayed, all processing will be halted on your computer. Your local program will stop running and remote nodes will be waiting for a response from your server.

If you are running a graphics program, you may not get the above menu. The above keystrokes are valid, however, and you will still get the two beeps if there are active logins or open network files.

After pressing S to shutdown the server, you will see the following screen:



This screen will be displayed while the server shutdowns. Once the server is shutdown, you will see the following display:



You can now press Ctrl-Alt-Del to reboot the server or you can turn off the server.

There may be times when the Ctrl-Alt-Del sequence will not work. This can occur if a program on your machine intercepts this key sequence or when a program runs uncontrollably and crashes your server. In these cases, you may need to power the server off and on or press the reset button if you have one.

## CHAPTER 8 THE NET MENU

The NET menu allows you to connect to network resources, print files, send or receive mail, login or logout of a server, and display the activity on a server. Many of the NET menu functions can be performed using the NET line commands, although the NET menu is easier to use. The NET menu also has an extensive online help facility. The NET menu would not be used to make network connections if you use the NET line commands in your AUTOEXEC.BAT file.

All NET screens have the following title:

LANtastic (tm) Connection Manager V.2.33 - Copyright (C) 1988 by ARTISOFT Inc.

To enter the NET menu, run the NET program without any arguments. When you type:

NET

a menu similar to the following will appear:

```
Main functions
-----
Network disk drives and printers
Printer and mail queues
Login or Logout
Display system activity on server
```

To perform any of the "Main functions", select the appropriate function and press Enter.

Before you can access a remote server, you will need to login to the server. You can select "Login or Logout" to do this. You can also login or logout of a server in any of the other menus. The login/logout menu is identical in both cases. Choosing Login or Logout displays the following menu:

```
Server Connections
-----
\\AT
```

This is a list of servers that you are currently logged into. If the screen is blank, you are not currently logged into any servers on the network.

If you want to logout of a server, select the server and press Del. The following menu will appear:

```
Press Enter to confirm DELETE, Escape to exit
-----
```

To confirm the delete you must press Enter. If you change your mind and don't want to logout, then just press Esc.

## LOGGING IN OR LOGGING OUT

## SPECIFYING A SERVER NAME

If you want to login to a server, proceed to the next section.

You will see a list of all servers you have logged into. If the server you want to connect to is not on the list, then you will need to login. To login into a server, press Ins. The following menu will appear:



```
Enter the SERVERNAME
_____
```

Type the name of the server you want to log into. The server name may be up to 15 characters long.

## SPECIFYING A USERNAME

Once you have typed the server name you will be prompted for your username:



```
Enter your USERNAME
_____
```

You should now type in your username. Your username may be up to 16 characters long. The username that you type must have been entered in the User Account Information menu in the NET\_MGR program.

## SPECIFYING A PASSWORD

After typing your username, you will be asked to enter your password:

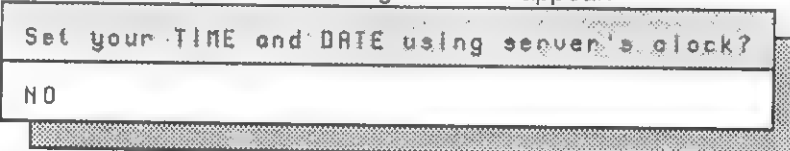


```
Enter your PASSWORD
_____
```

Your password may be up to 16 characters long. As you type your password you will not see it on the screen. This prevents other users from seeing your password as it is entered. If you have forgotten your password, you must enter the NET\_MGR program to assign a new password or contact your Network Manager.

## SETTING DATE AND TIME FROM THE SERVER'S CLOCK

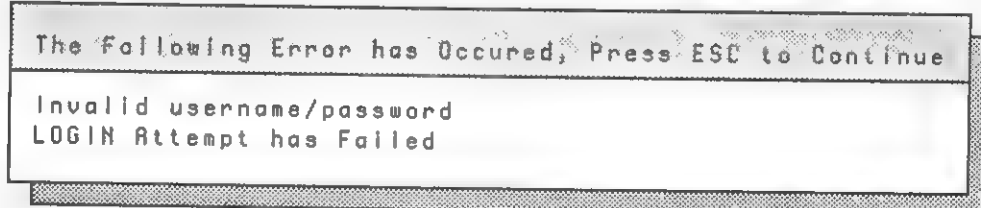
After you enter your password, you will be asked if you want your time and date set using the server's clock. The following menu will appear:



```
Set your TIME and DATE using server's clock?
NO
```

The default answer "No" has been pre-entered for you. If your computer does not have a battery backed-up clock, you may want to have the date and time set. You may also want the date and time set if the server is in a different time zone.

If you successfully login, you will see the server you logged into on the list of available servers. If your login attempt fails, you will receive an error message. The following is a typical error you will get if your username/password combination is incorrect:



```
The following Error has Occured, Press ESC to Continue
Invalid username/password
LOGIN Attempt has Failed
```

See Chapter 13, Error Messages for a complete list of possible errors.

## NETWORK DISK DRIVES AND PRINTERS

The "Network disk drives and printers" menu can be used to examine, connect, or disconnect your network drives and printers. The menu is accessible by selecting "Network disk drives and printers" from the "Main functions" menu. Once you have made the selection, a menu similar to the following is displayed:

```
Drive and printer connections
PRN      \\AT\@PRINTER
LPT1     \\AT\@PRINTER
LPT2
LPT3
A:       (Physical)
B:       (Physical)
C:       (Physical)
D:       \\AT\ROOT
E:
F:
G:
H:
I:
```

All of your drive and printer connections are displayed in the "Drive and printer connections" window. You can use the window positioning keys to move about and see entries which may not fit in the window.

The keys A-Z and 1,2,3 may also be used to position within this window. The keys A-Z position to the corresponding drive letter. The keys 1,2,3 position to LPT1, LPT2, or LPT3 respectively. No special key exists for positioning to PRN since PRN is functionally equivalent to LPT1.

The window consists of printers and disk drives. The last disk number that is displayed in the window corresponds to the "LASTDRIVE=" command in your CONFIG.SYS.

To connect to a network drive or printer you must select a local disk or printer to link to the network drive or printer. All of the available local disks and printers are listed in the "Drive and printer connections" menu. If you see the text (Physical) after a drive, it means that the drive physically exists on your machine. You should avoid using these drives to link to network disks because once selected as a network drive, your data on the physical drive is not accessible.

If you see text beginning with "\\ " for a drive or printer, it means that that drive or printer is connected to a network drive or printer. The full network path of the connection is listed next to the drive or printer.

Once you have selected the local disk drive or printer you want to connect to the network, press Enter. A menu similar to the following will appear:

```
Server Connections
\\AT
```

## EXAMINING DRIVE AND PRINTER CONNECTIONS

## CONNECTING TO NETWORK DRIVES AND PRINTERS

Select the server on which the network resource you want to use exists. If the server you want to connect to is not listed, then you will need to login to the server first. You can log into a server at this point by pressing Ins or you can escape back to the Main functions menu. See the "Login or Logout" section for more details about logging in.

When you have selected the server and pressed Enter, a menu similar to the following will appear if you are connecting a drive:

Shared directories/devices on server \\RT		
.	RWCMLDKNEA	- Server's network directory
ROOT	RWCMLDKNEA	- Root Directory
ADA	RWCMLDKNEA	- Ada program directory
DOS	RWCMLDKNEA	- DOS programs
FLOPPY_B	RWCMLDKNEA	- Low density floppy drive

A menu similar to the following will appear if you are connecting a printer:

Shared directories/devices on server \\RT		
@IMAGE	RWC - L -----	Image mode printing
@PRINTER	RWC - L -----	Normal printer - 12 cpi
@WIDE	RWC - L -----	Wide printer - 18 cpi
@MAIL	RWC - L -----	Mailbox for sending mail
@NOBANNER	RWC - L -----	No banner output printing

Both menus contain similar information. The menus have three fields:

- The shared resource name.
- The access you have to the resource.
- The shared resource description.

To select a shared resource, highlight the resource and press Enter. Once you have made your resource selection, the full network path of the resource will be displayed along with your local drive or device name. If you escape back to the system prompt and change to the drive specifier that you just redirected, you would see all files in that network subdirectory and be able to use the subdirectory as though it were located on your computer. This assumes that you have been given full access to the subdirectory in the NET\_MGR program.

The following sections describe in more detail what each of the three resource fields mean.

#### SHARED RESOURCE NAME

Each server resource is known on the network by the shared resource name. The shared resource name is created by the Network Manager using the NET\_MGR program.

The shared resource "." corresponds to the server's network control directory. This resource is a directory which actually contains all the shared server resources. If you were to attach a disk to the "." resource and then did a DIR of the disk, you would get a directory listing similar to the following:

Volume in drive D is AT  
Directory of D:\

.	<DIR>	1-14-88	5:06p
..	<DIR>	1-14-88	5:06p
@IMAGE	450	4-16-88	2:01p
@PRINTER	450	4-09-88	10:34a
@WIDE	450	1-18-88	2:41p
@MAIL	450	1-14-88	5:07p
@NOBANNE	450	1-18-88	2:36p
ROOT	<DIR>	1-14-88	5:13p
ADA	<DIR>	1-15-88	2:19p
DOS	<DIR>	1-15-88	2:20p
FLOPPY_B	<DIR>	1-23-88	8:39p

11 File(s) 1505280 bytes free

You will notice that all shared disks and directories created in the NET\_MGR program appear as directories and that all shared printers and mail appear as files. You can actually change directory (CD) into each of the shared directories, or copy data to the shared printers. For example,

```
D:
COPY C:\AUTOEXEC.BAT @PRINTER
CD DOS
```

### SHARED RESOURCE ACCESS

The access you have to the resource is displayed using access control letters. An access control letter is specified for each type of access you have. A dash (-) is displayed for every access that you do not have. If you have no access to the shared resource, then the shared resource is not displayed.

The ACL is displayed so that you can know what level of access you have and not be surprised if you are denied access. For example, if a shared directory resource was listed with no write access (W not present), and you connected to the shared directory, you should not be surprised when you copy a file to the directory and get a file creation error message.

### SHARED RESOURCE DESCRIPTION

The shared resource description is a more detailed description of the shared resource. This field may be blank if the Network Manager has not entered any description.

---

To delete your connection to a shared resource, you must select the resource in the "Drive and printer connections" menu and press Del. If you had connected over an existing physical drive, your physical drive would revert back to its original state.

All of your network drive and printer connections to a particular server will also be deleted when you log out of the server. The corresponding connections will no longer appear in the "Drive and printer connections" menu.

---

The "Printer and mail queues" menu allows you to view, create or modify both printer queue entries and mail entries. LANtastic treats both types of entries similarly. The only difference is that mail entries are never printed and may be viewed by both the originator and recipient of the mail. The printer and mail queues menu may be accessed by selecting "Printer and mail queue" in the Main Functions menu. Once you select this option, you will be given a list of your

## DELETING NETWORK DRIVE AND PRINTER CONNECTIONS

## PRINTER AND MAIL QUEUES

current server connections:

```
Server connections
\\AT
\\HOST
\\MAIN-AT
```

Select a server on which there are printer and mail queues you want to examine or modify. Only servers which you have logged into will be displayed. If you don't see the server you want, you will need to login to the server first. See the "Logging in or Logging out" section for information about logging into a server.

Once you have selected the server, press Enter. A menu similar to the following will be displayed:

```
Spooled queue entries on server \\AT
210 PRINTER DESPOOLING BOBBY FINANCE.OUT
211 PRINTER WAITING BOBBY REPORT.OUT
212 MAIL WAITING MANAGER Large disk space usage
213 PRINTER HELD BOBBY RUNTAX.BAS
234 MAIL WAITING BOBBY Waiting for your report
```

Your menu display will have different print and mail jobs listed in the queue. If you have not spooled any print jobs or sent any mail, the above menu will be blank.

Only queue entries you may access are displayed in this menu. Usually this includes:

- Only your print jobs.
- Mail sent to you.
- Mail you have sent.

If you have been given the SuperQueue privilege in the NET\_MGR program, then you can also see all other print jobs. If you have SuperMail privilege, then you can see all other mail entries.

Each queue entry has five columns of information:

- The entries sequence number.
- The type of queue entry.
- The queue entry status.
- The originator of the queue entry.
- Optional comment text.

Additional information about a queue entry may also be obtained. See the next section on "Controlling individual queue entries."

Each entry has a sequence number. As new entries are created they get higher sequence numbers. The sequence number is used by the despooler to print your printer jobs in order. Although sequence numbers are also assigned to mail

entries, they have no significance.

An entry may be either a print entry or a mail entry. Print entries have the type "PRINTER". Mail entries have the type "MAIL".

The queue entry status shows you the state of the queue entry. The various states that an entry may take are:

<b>DESPOOLING</b>	Entry is currently being despoiled. Despooling means that it is being sent to the printer.
<b>WAITING</b>	Entry is waiting to be despoiled. Entries remain waiting until they are despoiled.
<b>HELD</b>	Entry has been held. A held entry won't be despoiled until it is released. Held entries may be deleted.
<b>UPDATING</b>	Entry is currently being created.
<b>DELETED</b>	Entry is in the process of being deleted. An entry is marked as deleted only if it was in the process of being printed. Its status stays deleted until a *CANCELLED* message is printed on the printed output.
<b>*RUSH*</b>	Entry has been rushed by a privileged user. Rushed entries are printed before any other entries.

The originator of the queue entry is the username of the person who placed the entry in the queue. For print entries this corresponds to the person who printed the file. For mail entries this corresponds to who mailed the file. If the originator name for a mail entry is not your name, then it means that this mail was sent to you by another user.

The optional comment text is usually the subject of the mail if the entry is a mail file. For printer files this is usually the filename if the NET PRINT command was used to spool the file. You can place any text in this field. For print files, the text is printed in large letters on the banner page.

The queue entry display is a snapshot of the server's queue. If you want to update the display to see if anything has changed, press the space bar. A new snapshot of the queue entry will then be taken and displayed.

You have a wide choice of options that you can perform on an individual queue entry or the printer despooler. To control an individual queue entry, select the entry and press Enter. To control the despooler you can select any queue entry (or none if there are none) and press Enter. The following menu will be displayed:

```
Queue Control
Show      More information about selected entry
Hold      Suspend despooling of selected entry
Release   Allow selected entry to be despoiled
Delete    Remove selected entry from Queue
Read      View contents of selected entry
-----  Privileged Commands:
Halt      Halt all despooling
Stop      Stop despooling at end of current job
Pause     Temporarily suspend despooler
One-Job   One job is to be despoiled, then Stop
```

## CONTROLLING INDIVIDUAL QUEUE ENTRIES AND THE DESPOOLER

To see the rest of the Privileged Commands press PgDn:

Queue Control	
Delete	Remove selected entry from Queue
Read	View contents of selected entry
----- Privileged Commands:	
Halt	Halt all despooling
Stop	Stop despooling at end of current Job
Pause	Temporarily suspend despooler
One-Job	One Job is to be despoiled, then Stop
Start	Begin despooler if paused or stopped
Restart	Spool current entry from beginning
Rush	Gives queue entry top-priority

As you can see, you have a wide choice of options. The first set of commands is non-privileged and pertains to the individual queue entry you have selected. These commands may be used by anyone. The second set of commands are privileged and may only be issued by user's with SuperQueue privilege.

## NON-PRIVILEGED QUEUE COMMANDS

To execute a non-privileged queue command, select the appropriate command and then press Enter. The following sections explain each of the non privileged queue commands.

### SHOW

The Show command displays more information about a selected queue entry. When you select Show a menu similar to the following is displayed:

Detailed queue entry	
Sequence	211
Type	PRINTER
Status	WAITING
User	BOBBY
Comment	REPORT.OUT

This menu contains information you have already seen in the queue entry menu display. To view additional information, press PgDn. A menu similar to the following is displayed:

Detailed queue entry	
File's Origin	AT
Destination	@IMAGE
Date/Time	11-Apr-1988 14:07:52
Size in Bytes	10361
Copies	1

The fields for the detailed queue entry are explained below:

<b>Sequence</b>	The sequence number of the queue entry. See previous section.
<b>Type</b>	The type of queue entry (PRINTER or MAIL). See previous section.
<b>Status</b>	The status of the queue entry. See previous section.

<b>User</b>	The user who spooled the entry. See previous section.
<b>Comment</b>	The optional comment text. See previous section.
<b>File's Origin</b>	The machine the file was spooled from.
<b>Destination</b>	The destination printer resource, if this is a printer file. The recipient of the mail, if this is a mail entry.
<b>Date/Time</b>	The date and time the file was spooled.
<b>Size In Bytes</b>	The size of the queue entry in bytes.
<b>Copies</b>	The number of copies that were requested to be printed or mailed.

#### **HOLD**

The Hold command suspends despooling of the selected entry. The entry is placed in a HELD state until a release command is issued. A held entry may be held indefinitely. Usually you will hold an entry because you want to print it at a later date.

You may also hold mail entries, although this has no significant effect. Holding mail can be used as some kind of mail flag. For example, you may hold a mail entry after reading it to indicate to the sender that you have read the mail.

#### **RELEASE**

The Release command allows a HELD entry to be placed back in a waiting state. This frees the entry to be despoiled.

#### **DELETE**

The delete command may be used to remove a selected entry from the queue. You may delete both DESPOOLING and WAITING entries. When you delete a waiting entry it is removed from the queue immediately. If you delete a despooling entry, the entry is also deleted. The text \*CANCELLED\* is printed in large letters if you have a banner page enabled.

You can also delete a queue entry by selecting the queue entry and pressing Del. In this case you will be asked to confirm your queue entry deletion:

```
Press Enter to confirm DELETE, Escape to exit
```

The confirmation is displayed so that you don't accidentally delete a queue entry while positioning within the queue display.

#### **READ**

The Read command allows you to view or copy the contents of a queue entry. You will usually use this command to view mail entries, although it is also quite useful for examining printer entries.

When you select Read, the following menu will be displayed:

```
Output file that this Entry will be read into
CON
```

The entry CON has been pre-entered for you. If you select CON, the first 4K bytes

of the selected entry will be displayed on your screen:

```
MANAGER RE: Large disk space usage
```

```
Dear Computer User:
```

```
We are running quite short of disk space. If you have any unnecessary files, please be sure to delete them. On Monday, I will delete any queue entries that are over one month old. This includes old mail entries as well.
```

```
Bob
```

You may also elect to enter a filename. In this case, the selected queue entry is copied to the designated file. You will usually use this option to save your mail files. You can also elect to copy a printer entry to a filename.

You can perform privileged queue commands only if you have the SuperQueue privilege. If you have insufficient privileges to perform a privileged queue command, you will get the following error message:

```
The Following Error has Occured, Press ESC to Continue
```

```
You have been denied access on network node AT  
Queue Control Operation has Failed
```

Most of the privileged commands have corresponding NET command line commands. The following list explains each privileged command:

#### **HALT**

The Halt command halts all despooling immediately. If a print job is currently printing, the entire job will be placed back in the queue and the despooling stops. To start the despooler again issue a Start command.

See also: NET QUEUE HALT

#### **STOP**

The Stop command stops despooling at the end of the current print job. If no job is despooling, then despooling stops immediately. To start the despooler again issue a Start command.

See also: NET QUEUE STOP

#### **PAUSE**

The Pause command temporarily suspends despooling. If a print job is in the middle of printing, then it stops printing. When you start the despooler again the print job continues at the point at which it was stopped.

See also: NET QUEUE PAUSE

#### **ONE-JOB**

The One-Job command enables the despooler to print a single print job and then automatically stop.

See also: NET QUEUE SINGLE

#### **START**

The Start command enables the despooler to begin printing immediately when it is Halted, Stopped, or Paused. You will also use this command to begin despooling,

## **PRIVILEGED QUEUE COMMANDS**

if despooling is not ENABLED when the server boots up.  
See also: NET QUEUE START

### RESTART

The Restart command restarts the queue entry that is currently being printed from the beginning.

See also: NET QUEUE RESTART

### RUSH

The Rush command gives the selected queue entry top-priority. The entry is then displayed with the status \*RUSH\*. Rushed entries are printed out of sequence before other entries. You can rush more than one entry.

There are several ways of printing a file. To print a file using the NET menu system, insert a printer entry into the printer and mail queue. To do this, press Ins in the "Spooled queue entries..." menu. The following menu will appear:

## PRINTING A FILE

```
Shared directories/devices on server  Select Output Device
@IMAGE      RUCMLDKNER - Image mode printing
@PRINTER    RUCMLDKNER - Normal printer - 12 cpi
@WIDE       RUCMLDKNER - Wide printer - 18cpi
@MAIL       RUCMLDKNER - Mailbox for sending mail
@NOBANNER   RUCMLDKNER - No banner output printing
```

You should select the printer where you want to print and press Enter. The following menu will appear:

```
Name of file to send to the queue
CON
```

The entry CON has been pre-entered for you. If you select this entry, you will be prompted to enter text from your console using the NET text editor. You can also type over the CON entry with a filename you wish to print.

After selecting the file you wish to print, you will be asked to enter comment text that will be associated with the print entry:

```
Comment/Subject
```

Usually, you will enter a more detailed description of the file. This comment text is displayed in large letters on the banner page.

After specifying the comment, you will be prompted for the number of copies of the file you want printed:

```
Number of copies
1
```

If you press Enter without entering any copies, then one (1) copy is assumed. Since the number of copies you print does not effect the size of the queue entry, do not worry about specifying a large number of copies.

Once you enter the number of copies, the file will be sent to the print queue. If you specified that the print file is CON, then you will be prompted to enter in the text you want sent to the printer:



```
Text editor, Press Esc when ready to send
```

You may now enter the text you want to send to the printer. If you do not enter text, then no print queue entry will be created. You can use the cursor positioning keys to move around the screen. The F1 key may be used to insert a blank line. The F10 key may be used to delete a line. The F6 key may be used to restore a deleted line.

## MAILING A FILE

Mailing files is similar to printing files. To mail a file you need to insert a mail entry in the printer and mail queue with the destination being the person you want to receive the mail.

The instructions for printing a file apply when you mail a file. You need to be aware of the following points:

- After you press Ins to insert a queue entry, you must select the @MAIL shared resource. This signifies that you want to send your file to a mailbox.
- The prompts are the same as when you send a print file with the exception of being prompted for the user(s) to receive the mail rather than the number of copies:



```
User (s) to receive mail
```

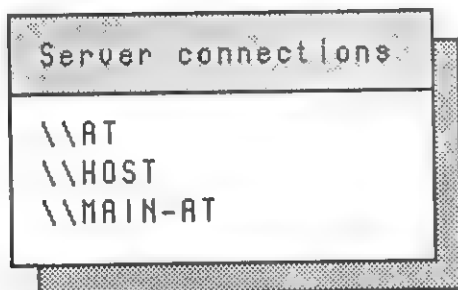
You may type a single username or username template. The username template allows you to send mail to multiple people at one time. A username template consists of a partial username followed by a star (\*).

Some sample valid usernames to send mail to are:

```
BOBBY  
MARY  
ADMIN-MANAGER  
ADMIN-  
$*  
.
```

When sending mail to username templates, only one copy of the mail exists.

You can determine who is using a particular server by selecting "Display system activity on server" in the Main Functions menu. Once you select this option, you will see a list of server connections:



Only servers that you have logged into will be displayed. If you don't see the server you want, you will need to login to the server first. See the "Logging in or Logging out" section for information about logging into a server.

Once you have selected the server you want, press Enter. A menu similar to the following will be displayed:

Active users logged into server \\MAIN-AT						
ID#	Username	Machine	Command	IO Kblks	Requests	Privs
1	MANAGER	MAIN-AT	STATUS	108	282	AQML
3	\$JANE	PC	DISK FREE	0	10	AQML
257	ADMIN-MANAGER	PC-ROOM-111	READ	1923	451	UL
4	ADMIN-SMITH	AT-ROOM-121	LOCK	127	97	L
5	FRANK	HOST	WRITE	382	283	PL
513	\$JAMES	REMOTE-SITE-1	OPEN FILE	52	29	AL
1027	?	REMOTE-SITE-2	LOGIN	0	0	

Each entry on the menu corresponds to a user accessing the server. The screen is a snapshot of the server activity. To update the screen, press the space bar.

Each field of the menu is explained below:

#### ID#

ID# corresponds to the identification number of the user accessing the server. Every user has a unique identification number.

#### USERNAME

Username is the name under which the user logged in. If the username is '?', then someone is in the process of logging in.

#### MACHINE

Machine is the machine the user logged in from.

#### COMMAND

Command represents the last major server command the user requested. Even though a command may be listed, it does not imply that the command was performed. A server operation may fail due to insufficient access rights or privileges. The names and descriptions of each of the server commands is listed below:

#### ACL READ

Shared resource access control list (ACL) information was read.

## DISPLAYING SYSTEM ACTIVITY ON A SERVER

<b>CLOSE FILE</b>	A file has been closed.
<b>COMMIT FILE</b>	File data has been committed to disk.
<b>CREATE DIR</b>	A directory has been created.
<b>CREATE FILE</b>	A file has been created. An existing file with the same name may have been overwritten.
<b>DELETE DIR</b>	A directory has been deleted.
<b>DELETE FILE</b>	A file has been deleted.
<b>DISK FREE</b>	Disk free space information was obtained.
<b>FIND FIRST</b>	A file was looked up.
<b>FIND NEXT</b>	Subsequent files were looked up.
<b>GET QUEUE</b>	Queue entry information was obtained.
<b>GET TIME</b>	The server's date and time was obtained.
<b>LOCK</b>	A file region has been locked.
<b>LOGIN</b>	The user is in the process of logging in.
<b>NEW FILE</b>	A new file has been created.
<b>OPEN FILE</b>	A file has been opened.
<b>QCONTROL</b>	A queue entry was modified or the despooler was controlled.
<b>READ</b>	Data has been read.
<b>RENAME FILE</b>	A file has been renamed.
<b>SEEK</b>	A file seek was performed.
<b>SET ATTRIBU</b>	A file's attributes have been changed.
<b>SET QUEUE</b>	Detailed queue entry information was modified.
<b>STATUS</b>	System status information was obtained.
<b>TERMINATE</b>	The user has just exited a program.
<b>UNIQUE FILE</b>	A new file has been created with a unique name.
<b>UNLOCK</b>	A file region has been unlocked.
<b>USER AUDIT</b>	An attempt to write a user audit entry was made.
<b>WRITE</b>	Data has been written.

#### **IO KBLKS**

IO Kblks represent the amount of I/O performed in 1K byte (1024) increments since the user logged in.

#### **REQUESTS**

Requests is the number of server commands performed since the user logged in.

#### **PRIVS**

Privs lists the different privileges the user has. The meaning of the privilege letters is:

- A** **SuperACL.** All server file requests that the user performs will bypass ACL checking.
- Q** **SuperQueue.** The user is allowed to manipulate the despooler and all printer queue entries.
- M** **SuperMail.** The user can manipulate everyone's mail.
- P** **Peer.** The user's file requests are treated as having originated from the server as far as record and file locking is concerned.
- U** **User Audit.** The user may place an entry in the audit trail with NET AUDIT.
- L** **Logged in.** The user is fully logged into the server. If 'L' is not displayed, then the user is in the process of logging in.

You can perform many of the NET menu commands directly from the command line. This is very useful if you want to bring up the network from within a batch file or if you become quite familiar with the network and want to bypass the menu system. The following sections contain a list of all the NET keyboard commands, an explanation of each command and their usage. Also included is a section on how to customize your NET commands to suit your particular application.

---

In the list of NET commands, the following conventions are used:

- |  |   |
|--|---|
| <b>Lower case letters</b>                      | Denote arguments you supply.  |
| <b>Arguments<br/>In brackets "[ ]"</b>         | Denote optional arguments.  |
| <b>Vertical bars " "<br/>between arguments</b> | Denotes that any of the arguments between the bars may be specified.  |
| <b>Ellipses "..."</b>                          | Mean that the preceding argument may be repeated any number of times. |

## CHAPTER 9 NET LINE COMMANDS

### NET COMMAND LIST

## NET AUDIT

**NET AUDIT** \\server-name reason variable-string

The NET AUDIT command places an audit entry in the server's audit file. You may want to enter audit entries to mark the progress of your programs or to log significant events. You must have U privilege to issue this command.

<b>server-name</b>	The server where you want the audit entry to be placed.
<b>reason</b>	A character string (up to 8 characters) which gives the reason for the audit entry.
<b>variable-string</b>	A character string (up to 64 characters) which gives more detailed information about the audit. If you want to include blanks and commas in the variable reason field, then you must enclose it in quotes.

### EXAMPLES:

```
NET AUDIT \\host start "Sorting procedure"
```

```
NET AUDIT \\host stop "Sorting procedure"
```

```
NET AUDIT \\main-server *error* parity
```

```
NET AUDIT \\main warning "Power fluctuating"
```

## NET CLOCK

**NET CLOCK** \\server-name

The NET CLOCK command allows you to set your system clock (date and time) from a server's clock.

<b>server-name</b>	The server whose date and time you wish to use. You must already be logged into the server.
--------------------	---

## NET HELP

### NET HELP

The NET HELP command displays a list of valid NET keyboard commands. You can use this command to refresh your memory. You can use the NET HELP command to see if any new NET commands have been added since the publication of this manual. The NET HELP command lists keyboard commands in common usage order rather than alphabetical order.

#### EXAMPLE:

### NET HELP

displays the following type of information:

#### NET Usage:

```
NET LOGIN \\Server_name Username Password
(adapter #)
NET LOGOUT \\Server_name
NET USE D: \\Server_name
NET USE D: \\Server_name\Path\...\Path
NET USE LPTn: \\Server_name\@Device (n=1,2 OR3)
NET UNUSE D:
NET PRINT[/B] filename device [comment] [copies]
NET CLOCK \\Server_name
NET LPT [COMBINE,FLUSH,SEPARATE]
NET LPT TIMEOUT t (t=time in seconds)
NET QUEUE [START, STOP, HALT, PAUSE,
SINGLE, RESTART] \\Server_name
NET AUDIT \\Server_name reason "audit text string"
NET SHOW
```

NET with no arguments will use the window interface.

## NET LOGIN

**NET LOGIN \\server-name username password  
(adapter number)**

The NET LOGIN command allows you to log into a server whose resources you wish to use.

<b>\\server-name</b>	Specifies the name of the server you want to log into.
<b>username</b>	Specifies the username you will use to log into the server.
<b>password</b>	Specifies the password that corresponds to your username.

<b>adapter number</b>	Specifies the number of the adapter in the server that you want to login through. When adapter number is not specified, the login will be attempted on all available adapters. When an adapter number is specified, LANtastic NOS will attempt a login only on that adapter.
-----------------------	--

#### EXAMPLES:

```
NET LOGIN \\host ADM_jerry secret
```

```
NET LOGIN \\host Mary Flip 1
```

Before the NET LOGIN command can work, you must have run the redirector and your username and password must exist on the server.

## NET LOGOUT

### NET LOGOUT `\\server-name`

The NET LOGOUT command is used to log out of a server and automatically release any resources you have used.

`\\server-name` Specifies the server you wish to log out of. You must have logged into server before you can logout.

#### EXAMPLE:

```
NET LOGOUT \\host
```

## NET LPT COMBINE

### NET LPT COMBINE

The NET LPT COMBINE command is only useful in a batch file. It enables you to combine redirected printer output. You must issue the command in your batch file as soon as you want the printer output combined. When your batch file is complete, DOS will automatically disable the combining and flush (close) your printer output.

In Example 1, the batch file would create two print jobs. One containing the text "A directory follows" and another containing the directory.

#### EXAMPLE 1:

```
echo A directory follows >lpt1  
dir/w >lpt1
```

In Example 2, the batch file would create one print job with both the echo text and the directory.

#### EXAMPLE 2:

```
NET LPT COMBINE  
echo A directory follows >lpt1  
dir/w >lpt1
```

## NET LPT FLUSH

### NET LPT FLUSH

The NET LPT FLUSH command is only useful in a batch file. It forces redirected printers to be flushed. You may issue this command in a batch file if you wish your redirected printer output to be flushed. Flushing the printer output causes the print job to be closed. The FLUSH command is only effective if you have issued a NET LPT COMBINE command.

#### EXAMPLE:

NET LPT COMBINE	-Combine printer output
echo First print job >lpt1	-Display a text message
dir/w >lpt	-Do a directory
NET LPT FLUSH	-Flush the printer output
echo Second print job >lpt1	-Display a text message
dir/w >lpt1	-Do a directory

## NET LPT SEPARATE

### NET LPT SEPARATE

The NET LPT SEPARATE command is only useful in a batch file. It disables redirected printer combining. You may issue this command in your batch file if you don't want printer combining. Since SEPARATE is the default mode, you will not issue this command unless you have previously specified a NET LPT COMBINE command.

#### EXAMPLE:

NET LPT COMBINE	-Combine printer output
echo First print job >lpt1	-Send text to printer
dir/w >lpt1	-Directory goes along with text
NET LPT SEPARATE	-Separate output (implicit flush)
echo Second print job >lpt1	-Separate print job
echo Third print job >lpt1	-Separate print job

will create three print jobs since the NET LPT SEPARATE will nullify the NET LPT COMBINE command.

## NET LPT TIMEOUT

### NET LPT TIMEOUT t

The NET LPT TIMEOUT command is used to specify a timeout value in seconds for data being sent to redirected printers (PRN, LPT1, LPT2, and LPT3). If no data is sent and the timeout value expires, all data being sent to redirected printers is flushed. This is effectively the same as pressing Ctrl-Alt-PrtScr. When the data is flushed, you will get a confirming beep.

**t** The timeout value 't' may be 0 to 3600 seconds. If t is omitted, then a value of 0 is assumed. A value of 0 disables timeouts. The default is that timeouts are disabled.

#### EXAMPLE:

```
NET LPT TIMEOUT 5
```

Note: See Chapter 10, Network Printing for more information.

## NET PRINT

```
NET PRINT[/B] file(s)-to-queue network-printer  
[comment] [copies]
```

The NET PRINT command is used in place of the normal DOS PRINT command to send printer output to network printers.

<b>/B</b>	Designates that the file is a binary file and that NET PRINT should not stop if it encounters an EOF character (^Z).
<b>files(s)-to-queue</b>	A file path to queue. You may use wildcard characters.
<b>network-printer</b>	A network printer name. You may use both full network paths or redirected printer names.
<b>comment</b>	An optional comment to be printed on the banner page. If omitted, then the filename is used.
<b>copies</b>	The number of copies of the file(s) you want printed. If omitted, then one copy is assumed.

#### EXAMPLES:

```
NET PRINT report.txt lpt1
```

```
NET PRINT *.bas \\host\@printer
```

```
NET PRINT/b x?.out \\server\@graphics "Plotter files"
```

```
NET PRINT label.out lpt2,,1000
```

## NET QUEUE HALT

### NET QUEUE HALT \\server-name

The NET QUEUE HALT command is used to halt despooling immediately and NOT finish the current print job. The current print job is automatically placed back in the queue for later printing. Once halted, the despooler will not print any more jobs until you issue a NET QUEUE START command. If no jobs were printing when you issued the HALT command, despooling will still halt. You must have the Q privilege to issue this command.

\\server-name	The name of the server where you want despooling to halt.
---------------	---

#### EXAMPLE:

```
NET QUEUE HALT \\host
```

## NET QUEUE PAUSE

### NET QUEUE PAUSE \\server-name

The NET QUEUE PAUSE command may be used to temporarily suspend printer despooling. The current despooling job stops printing immediately, but is still in a despooling state. To resume despooling, use the NET QUEUE START command. You must have the Q privilege to issue this command.

\\server-name	The name of the server where you want despooling to pause temporarily.
---------------	--

#### EXAMPLE:

```
NET QUEUE PAUSE \\main-server
```

## NET QUEUE RESTART

**NET QUEUE RESTART \\server-name**

The NET QUEUE RESTART command may be used to restart the current print job from the start of the file. RESTART is useful when printer paper jams and you want to start a job from the beginning. You must have the Q privilege to issue this command.

**\\server-name**                      The name of the server where you want the currently despooling job to be printed from the beginning.

### EXAMPLE:

NET QUEUE RESTART \\server-bob

## NET QUEUE SINGLE

**NET QUEUE SINGLE \\server-name**

The NET QUEUE SINGLE command causes the despooler to print a single job and then stop. This is useful when the printer needs manual intervention between each print job. To print successive single jobs you must issue the NET QUEUE SINGLE command repeatedly. If you issue this command when a job is printing, the despooler will stop at the end of the current job. You must have the Q privilege to issue this command.

**\\server-name**                      The name of the server where you want the next single print job to be printed.

### EXAMPLE:

NET QUEUE SINGLE \\big-386-server

## NET QUEUE START

**NET QUEUE START \\server-name**

The NET QUEUE START command is used to start the print despooler. Print jobs waiting in the queue are printed. You will need to do a NET QUEUE START if despooling is disabled in the server startup parameters and you want print jobs to print. If despooling is enabled in the server startup parameters, then the server does an implicit NET QUEUE START when it is first started. You must have the Q privilege to issue this command.

<b>\\server-name</b>	The name of the server where you want the despooler to begin printing.
----------------------	--

### EXAMPLE:

**NET QUEUE START \\print-server**

## NET QUEUE STOP

**NET QUEUE STOP \\server-name**

The command NET QUEUE STOP is used to stop despooling AT THE END of the current print job. The current print job will finish printing and then no more print jobs will print. If no job is printing, then NET QUEUE STOP will stop despooling immediately. If you want despooling to resume later, you will need to issue a NET QUEUE START command. You must have the Q privilege to issue this command.

<b>\\server-name</b>	The name of the server where you want the despooler to stop.
----------------------	--

### EXAMPLE:

**NET QUEUE STOP \\host**

## NET SHOW

### NET SHOW

The NET SHOW command displays the current state of the network. You must have started the LANtastic redirector before issuing this command.

#### EXAMPLE:

### NET SHOW

```
LANtastic (tm) Connection Manager - V2.40
Copyright (c) 1988 by ARTISOFT, Inc.
Machine HOST is being used as a Redirector and a
Server
File and record locking currently DISABLED
LPT Timeout: 0 Seconds
Logged into: \\ACCOUNTING
Logged into: \\MAIN-SERVER
Logged into: \\HOST
Disk D: is redirected to \\MAIN-SERVER\CD-ROM
Device PRN is redirected to \\HOST\@PRINTER
```

## NET UNUSE

### NET UNUSE [d: | PRN | LPTn]

The NET UNUSE command is used to remove a redirection from a previous NET USE for a disk or printer. Once you issue the NET UNUSE command the disk or printer reverts back to its original definition.

<b>d:</b>	Specifies a disk you have previously redirected and wish to revert to its original state.
<b>PRN</b>	Indicates that you wish to restore the printer (LPT1) to its original unredirected state.
<b>LPTn</b>	Indicates that you wish to restore printer LPT1, LPT2 or LPT3 to its original unredirected state.

#### EXAMPLES:

NET UNUSE F:

NET UNUSE LPT1

## NET USE

**NET USE [d: | PRN | LPTn] \\server-name[\path...]**

The NET USE command allows you to redirect a disk or printer with a server resource.

<b>d:</b>	Specifies your local disk which you wish to redirect to a server directory. (E.g. F:)
<b>PRN</b>	Indicates that you wish to redirect the printer (LPT1) to a server printer or file.
<b>LPTn</b>	Indicates that you wish to redirect LPT1, LPT2 or LPT3 to a server printer or file.
<b>\\server-name</b>	Specifies the server to which you want to redirect your disk or printer.
<b>\path</b>	Specifies a path to a shared server resource such as a disk, directory, or printer.

**Note:** The devices PRN and LPT1 are interchangeable in the command line and represent the same printer.

### EXAMPLES:

NET USE F: \\host\root

NET USE LPT1 \\server\@printer

NET USE G: \\large-pc

## NET COMMAND LINE CUSTOMIZING

### PROMPTING WITH ECHO

You can customize your NET command line commands to automatically prompt for input. You can place several special characters on the command line to assist you in prompting for arguments. The characters are:

- A question mark (?) for question prompting with echo.
- An up arrow (^) for prompting with no echo.
- Single quote (') or double quotes (") for literals.
- A comma (,) for delimiting arguments.

---

You can prompt for input on the command line by preceding a NET argument with a question mark (?). Anything that the user types echos on the screen and replaces the argument that was preceded by the question mark. For example,

```
NET LOGIN \\host ?Username: ?Password:  
USERNAME:bob  
PASSWORD:secret
```

The word 'bob' replaces ?Username: and the word 'secret' replaces ?Password:. So the above command is the equivalent of:

```
NET LOGIN \\host bob secret
```

You can prompt for input for any argument in the NET command line including the first argument. For example,

```
NET ?Command: ?Arg1: ?Arg2:  
COMMAND:use  
ARG1:n  
ARG2:\\host\root
```

is the equivalent of typing

```
NET USE N: \\host\root
```

### PROMPTING WITHOUT ECHO

---

You may have noticed in the above example that the user's password echoed as it was typed. If you don't want the password to echo, you should use the up arrow (^) character instead of the question mark. For example,

```
NET LOGIN \\host ?Username: ^Password:  
USERNAME:bob  
PASSWORD:
```

### SPECIFYING LITERAL ARGUMENTS

---

You may have noticed in the above example that the prompts 'Username:' and 'Password:' were converted to upper case before being displayed. If you don't want arguments converted to upper case or if you want to embed spaces in your arguments, you can surround the arguments with either double or single quotes. If you need to prompt for input and also use quoted arguments, then the question mark or up arrow must be the first characters inside your quote string. For example,

```
NET LOGIN \\host '?Username: ' '^Password: '  
Username: bob  
Password:
```

You can also use double quotes to surround arguments that have single quotes and visa versa. For example,

```
NET LOGIN \\host '?Username: ' '^Enter password (it won't echo): '  
Username: bob  
Enter password (it won't echo):
```

In the above example, double quotes are surrounding the last argument which contains both spaces and a single quote.

---

Normally you will use spaces between arguments on a NET command line. There are cases, however, when you will need to omit an argument from a NET command. For example, you may want to omit the comment argument on a NET PRINT command but you may want to specify the number of copies:

```
NET PRINT *.BAS LPT1 <want comment omitted> 10
```

In order to do this, the comment field must be empty. Even though you can specify multiple spaces between arguments when typing,

```
NET PRINT *.BAS LPT1    10
```

the 10 will still be taken as the comment field.

To resolve this problem, all NET commands allow you to use commas to separate arguments. The above command could be entered as:

```
NET PRINT,*.BAS,LPT1,,10  
or  
NET PRINT *.BAS LPT1,,10
```

and 10 would not be taken as the comment field.

You cannot, however, use a comma between the NET command and the subsequent subcommand, i.e. NET, PRINT \*.BAS.

## DELIMITING ARGUMENTS

Because multiple workstations may contend for a single printer at one time, and because of the way certain programs print, network printing will be somewhat different than local printing.

When a local printer port (LPT1-LPT3) has been redirected to a server printer, any data sent to the printer is spooled to the server's disk. Knowing where to send the printer data is not a problem, but knowing when a program is done sending printer data may be a problem for the LAN software.

Some programs open and close the printer as if it were a file. When these programs close the printer they indicate that they are done using the printer. LANtastic uses this message to allow the printer job to begin despooling. All DOS commands treat printers in the same fashion. You do not have to take any special action when dealing with DOS commands.

There are many programs, however, which send printer output directly to the low level printer BIOS - bypassing DOS. LANtastic correctly redirects these printers also. Many text editors and spreadsheets output printer data this way.

Unfortunately, these programs do not indicate when they are finished using the printer. When they send data to a local printer it is obvious when the print job is complete, but when they send data to a redirected network printer, there is no guaranteed way to know that the print job is truly finished.

LANtastic provides several mechanisms to handle this kind of redirected printer output:

- 1) LANtastic automatically closes redirected printers when your program exits.
- 2) You can type Ctrl-Alt-PrtSrc to force redirected printers to be closed thereby printing your output.
- 3) You specify a printer timeout period to elapse before LANtastic automatically closes redirected printers.

---

Whenever any program terminates (finishes executing), LANtastic will automatically close any redirected printers. If the printers are already closed, then no action is taken. You may notice that some of your printer output is not printed until you exit the program that does the printing. This is due to LANtastic's automatic printer closing when a program terminates.

If you don't want to exit your program so that printer output will print, you can press Ctrl-Alt-PrtScr. This forces any redirected printer to be closed. When the printer is closed, any printer data accumulated so far is flushed. You will receive a short confirming beep to indicate that the close operation has finished. You must wait until your program has sent all its data to the printer. If you press Ctrl-Alt-PrtScr too fast, you will split your printer data into two jobs.

If you want a more automatic way of closing redirected printers, you can use the NET LPT TIMEOUT command. This command allows you to specify a timeout period for redirected printer data. If no data is sent to the printer for the duration of the timeout period, then LANtastic automatically closes the redirected printers. You also get a short confirming beep to indicate that your redirected printers have been closed. You may choose a timeout period from 1 second to 1 hour. Usually a timeout period of about 10 seconds is enough. For example,

**NET LPT TIMEOUT 10**

**FORCED  
PRINTING**

## REDIRECTING PRINTER OUTPUT TO FILES

Normally, if you redirect a printer, you will redirect it to a shared printer device. For example,

```
NET USE LPT1 \\HOST@PRINTER
```

You can also redirect a printer to file on the server. For example,

```
NET USE LPT1 \\HOST\ROOT\OUTPUTS\FILE
```

This is very convenient when you want to capture printer output to a file but don't want the output to print at this time. Since Shift-PrtScr is redirectable, you can capture screen images and send them to a file.

Before you can redirect printer output to a file, however, you must assure that the file already exists. If the file does not exist, the NET USE command will fail. One way of doing this is to preface the NET USE command with a redirected ECHO command:

```
echo >\\HOST\ROOT\OUTPUTS\FILE  
NET USE LPT1 \\HOST\ROOT\OUTPUTS\FILE
```

The echo command assures that the file is created before the NET USE command is issued.

## THE LANtastic DESPOOLER

The LANtastic despooler is an integral part of the LANtastic server. The despooler is responsible for taking spooled print jobs from the printer queue and sending them to the appropriate printer. The despooler is controlled through network operations and can therefore be controlled from any node on the network. Of course, you must have been given the appropriate privilege (Q) to control the despooler.

You can control whether the despooler becomes active at initial server startup time or not. If you specify that the despooler should be active (enabled), print jobs are despoiled as soon as the printer is available. If you specify that the despooler should not be active (disabled), print jobs accumulate in the print queue and are not despoiled until you explicitly start the despooler via the NET QUEUE START command or via the Printer and Mail Queue menu in the NET program. When disabled, the despooler is still present but it is in a halted state.

The despooler processes one print job at a time. Each print job has a sequence number. When the time comes to print, the despooler selects the job with the lowest sequence number and sends it to the appropriate printer. The only exception to this is when a job has been marked as a RUSH job. RUSH jobs are printed first, regardless of their sequence number.

## MODIFYING PRINTER PARAMETERS BEFORE PRINTING

You may modify all spooled printer parameters before a print job begins printing. This includes the physical printer as well as other printer parameters.

The destination printer to which a job will be printed, is determined by the printer logical destination name (e.g. @PRINTER, @LASER). The physical printer that corresponds to the logical printer name is determined just before the print job is printed. This allows you to change the physical printer after a job is in the print queue.

Other logical printer parameters such as banner page enabling, printer setup strings, tab expansion, printer speed, etc. can be changed before a print job is actually printed. When printed, the current print parameters will be used.

## HOW DESPOOLING AFFECTS A LOCAL PRINTER

When the despooler begins sending output to the printer, the printer is no longer accessible locally (e.g. you can't do a print screen or a copy to LPT1 on the server). This avoids intermixed output. The printer will not be available locally until the despooler prints to another printer or is halted.

In general, it is not advisable to have the despooler active while sending output directly to the line printer. Doing so may cause intermixed print jobs. If you log into the server as a user and redirect your printer output to the despooler, you can use the printer at the server .

The following sample sequence of events and the corresponding printer status may help you better understand how local printer availability is managed:

<b>EVENT</b>	<b>LOCAL PRINTER AVAILABILITY</b>
Server started	LPT1 available LPT2 available LPT3 available
Despooler started	no change
Despooler starts printing to LPT1	LPT1 not available LPT2 available LPT3 available
Despooler stops printing to LPT1	no change
Despooler starts printing to LPT3	LPT1 available LPT2 available LPT3 not available
Despooler stops printing to LPT3	no change
Despooler is halted	LPT1 available LPT2 available LPT3 available

---

If banner pages are enabled, each print job prints a banner page. The purpose of the banner page is to easily determine the contents of a print file and to determine the print file's ownership. This is useful when multiple people are sending printer output to the same printer. A banner page helps to sort out each print job. See Appendix II for a sample banner page. Three lines are generated in large characters on the banner page. These lines are:

- 1) The username of the user who spooled the output.
- 2) The machine the user was logged into when he spooled the output.
- 3) Optional comment text.

The three lines are repeated again at the bottom of the banner page in case the paper was not big enough to handle the large characters.

After the three repeated lines, additional information lines follow. The additional information lines are:

**Date**                                      The date the file was printed in the form  
YY.MM.DD where YY is the year, MM is the  
month, and DD is the day.

## THE PRINTER BANNER PAGE

## MANAGING THE PRINTER AND DESPOOLING JOBS

<b>Time</b>	The time the file was printed in the form HH:MM:SS where HH is the hour, MM is the minutes, and SS is the seconds.
<b>Printer</b>	The shared resource printer name.
<b>Device</b>	The physical device to which the despoiled output was sent.
<b>Width</b>	The width the printer was defined as and the width the banner page was printed in.
<b>Tabs</b>	The tab stop position. If tabs is 0, then no tab expansion is done.
<b>Copies</b>	The number of copies that follow.
<b>File</b>	The server filename of the file being despoiled.

---

You can manage the despooler from any computer on the network. It is usually most convenient to manage the despooler from the computer to which the printer is attached. All despooling control is handled through the network. Therefore, you must be logged into the server whose despooler you want to control. This is true even if you are physically located at the server.

To login to a server you can type:

**NET LOGIN \server-name username password**

or use the NET menu system. The username that you use to log in must have the Q privilege. If it does not have this privilege, then you cannot control the despooler - you can only control your own waiting print jobs.

While the despooler is sending output to your printer you may need to:

- Unjam a printer.
- Change a ribbon in the middle of printing.
- Cancel the job that is currently printing.
- Restart the job that is currently printing.
- Use your printer locally.

The despooler provides ways of controlling the print jobs so that you can easily take corrective actions. You may perform these corrective actions by using the NET menu system or using the NET QUEUE keyboard commands. This section will address most of these functions using the NET QUEUE commands.

---

Although the mechanics of actually unjamming a printer are not in the realm of this manual, you can facilitate the unjamming by issuing NET QUEUE commands. The command:

**NET QUEUE halt \server**

may be used to stop any output from being sent to the printer. Once you have unjammed the printer you can issue:

**NET QUEUE start \server**

## UNJAMMING A PRINTER

to start the print job over again. If you enter:

```
NET QUEUE pause \\server
```

the despooler will also stop sending output to the printer. When you type:

```
NET QUEUE start \\server
```

your output will continue from where it left off. You may lose some output due to the printer jamming and have to resend the job to the despooler.

---

If you see that the printer output is getting faint and you must change the ribbon in the middle printing, you can type:

```
NET QUEUE pause \\server
```

to temporarily suspend despooling. Once the ribbon has been changed, you can type:

```
NET QUEUE start \\server
```

to continue the printing right where it left off. If you can wait until the end of the current job, you should type:

```
NET QUEUE stop \\server
```

to stop the despooler at the end of the current job. You will then need to type:

```
NET QUEUE start \\server
```

to resume printing after the ribbon is changed.

---

The only way to cancel the current print job is to go into the Printer and Mail queue menu in the NET program. Select the job from the menu that you want to cancel and press Del. If you cancel a current print job and banner pages are enabled, you will see the text \*CANCELLED\* printed at the end of your job in large letters. The job will show as DELETED while the despooler is sending the last of the printer output.

There is no NET QUEUE command for canceling the current print job.

---

If at any time while a job is printing you want to start the job from the beginning you can type the command:

```
NET QUEUE RESTART \\server
```

which will start the current print job over.

---

If you want to print something locally, you must stop the despooler so that you have control of your printer. You will also need to cancel any redirection of your printer. For example,

```
NET UNUSE LPT1  
NET QUEUE STOP \\server
```

will cancel redirection of your LPT1 and stop the despooler at the end of the current print job. If you had never redirected your printer, then you would only

## CHANGING A RIBBON IN THE MIDDLE OF PRINTING

## CANCELING THE CURRENT PRINT JOB

## RESTARTING THE CURRENT PRINT JOB

## USING YOUR PRINTER LOCALLY

## DESPOOLING TO A COM PORT

need to enter:

```
NET QUEUE STOP \\server
```

---

The despooler sends all the printed output to LPT1, LPT2 or LPT3. If you have a serial printer attached to a COM port, you can send the printed output to the COM port by running the DOS MODE command to redirect output from the appropriate printer to the appropriate COM port. For example,

```
MODE COM1:9600,n,8,1,P  
MODE LPT1:=COM1
```

The above commands would initialize communications port COM1 for 9600 baud and redirect output from LPT1 to COM1. You should enter the above commands before you start the network, otherwise printer output will not be redirected. Normally the commands would be put in your AUTOEXEC.BAT file.

## CHAPTER 11 MISCELLANEOUS TOPICS

### ORGANIZING YOUR SERVER'S DISK(S)

This chapter will cover the following topics:

- 1) Organizing your server's disk (s).
- 2) Improving server performance.
- 3) Network/program compatibility.

If you are not interested in network security, then you may not be concerned with organizing your server's disk. You can leave the disk the way it currently is with no adverse effects.

If, however, your server's disk will be shared among several users, you should read this chapter because it may help you to protect data you may not want everyone on the network to see.

For a totally secure file server you should NEVER give full access to the entire server's disk. If you want to give some level of access to the entire disk then you should ONLY GIVE L (lookup) access. This allows directory lookups only. You should not give R (read) access. User passwords are one-way encrypted and therefore cannot be easily stolen. A determined user, however, may still be able to ascertain information that he is not normally allowed to see.

Normally, you should create directories on your server for various classes of storage. For example, you may want a separate directory for all application programs. If you have multiple disks on your server you may want to allocate an entire disk for a particular function. This will also help improve server performance.

The following diagram illustrates a sample server configuration:

Shared Resource Name	Linked Pathname	Access Control List ACL
ROOT	C:	*,L
APPS	C:\APPS	SYSTEM-MANAGER, RWCMLDKNEA *,L
DOS	C:\APPS\DOS	*,RLE
BASIC	C:\APPS\BASIC	*,RLE
USERS	C:\USERS	*,-
AMY	C:\USERS\AMY	ADMIN-AMY, RWCMLDKNEA ADMIN-*,RLE *,-
BOBBY	C:\USERS\BOBBY	ADMIN-BOBBY, RWCMLDKNEA ADMIN-*,RLE *,-
MANAGER	C:\USERS\MANAGER	ADMIN-MANAGER, RWCMLDKNEA *,-
ADMIN	D:\ADMIN	ADMIN-MANAGER, RWCMLDKNEA *,-
PROGS	D:\ADMIN\PROG	ADMIN-*,RLE *,-
DATABASE	D:\ADMIN\DATA	ADMIN-*,RWCLDN *,-

The main characteristics of this server organization are:

- No one has access to the entire disk.
- Each user has their own directory and limited access to other user's directories.
- Programs are broken into separate directories, although the entire application programs directory (APPS) is available for L access.
- Administrative data base files and programs reside on their own disk.

You can generally improve your server's performance in several ways:

- 1) You can specify a larger server buffer as a server SETUP option in the NET\_MGR program. This will generally help when transferring large amounts of data such as with the DOS COPY or XCOPY commands.

### IMPROVING SERVER PERFORMANCE

- 2) You can run the MS-DOS FASTOPEN program on the server if you have DOS 3.3. This will improve performance when doing a large number of file opens.
- 3) You can increase the BUFFERS= value in the server's CONFIG.SYS file. If you don't have disk caching, try BUFFERS=99.
- 4) You can use a disk caching program on the server. Make sure that the disk caching software is compatible with networks. If you use caching, lower the size of BUFFERS= to maybe 4 or 5.
- 5) You can install a faster disk. Even if you have disk caching software, a faster disk will always improve performance.
- 6) You can install a faster server. If you have a XT type server, you can upgrade it to a 286 or 386 machine.
- 7) You can avoid running programs on the server. When you run programs on the server you are contending for the server along with all network users. This will reduce the response that remote users will see. If you have to run programs on the server and you don't want as much contention, you can login to the server as if you were a remote node. This has the effect of scheduling you along with the rest of the network users.
- 8) You should increase the "Network Tasks" in the server startup parameters menu if you have multiple adapters installed or if there will be multiple users logged into the server at the same time. See "Network Tasks" in Chapter 6 for more information.

## NETWORK/ PROGRAM COMPATIBILITY

---

Networks are a departure from the classical single user - single PC environment. Many programs are written without networks in mind and therefore do not operate optimally in a multiuser network environment. Most programs, however, will run in a network environment, primarily because the network compensates for the programs.

Always keep in mind that you are bound by the license agreement of the software you are attempting to run on the network. Many license agreements specify that the program may only be used by one person at any given time on one computer.

This section examines several typical network/program incompatibilities and the method for trying to resolve the incompatibility. The incompatibilities fall into the following categories:

- 1) Programs which don't use files in a shared fashion.
- 2) Programs which make direct reference to hardware.
- 3) Programs which work only on a specific disk.
- 4) Copy protected programs.

---

This is the largest set of incompatible programs because most DOS programs don't expect more than one user to access a file at the same time. The DOS SHARE program prevents two user's on separate machines from accessing the same file at the same time if the file is not opened in a sharing mode. This has both an advantage and disadvantage. The advantage is that if two network users attempt to open a file for writing at the same time, only one of them is allowed access to the file. The other user will get a message similiar to the following:

Sharing violation error writing drive C:  
Abort, Retry, Fail?

## PROGRAMS WHICH DON'T USE FILES IN A SHARED FASHION

This may be beneficial since the second user was not aware of anyone else writing to the file and the sharing violation prevented the data in the file from getting inadvertently scrambled. A sharing violation in this case is desirable.

The disadvantage comes about when two users (or programs) attempt to open a file for reading at the same time. This can occur when two people are typing the same file or are attempting to execute the same program at the same time. Worse yet, is when a program opens up a companion file (such as an overlay file) and keeps the file open during the duration of the program. In this case, a second user can never run the same program unless the first user has exited the program.

There are two schemes for allowing concurrent reading of the same file. The first is to make the file read-only. You can use the DOS ATTRIB command to do this. Once you make a file read-only, SHARE will allow multiple people to read the file since it knows that no one can write to a read-only file. For example,

#### **ATTRIB +R PROG.EXE**

will make the file PROG.EXE read only.

The second scheme is to make a separate directory for each invocation of the program and copy the program or data to each directory. Since each user would run or read data from their own directory they would be using unique files.

The first scheme is preferable since it minimizes file duplication and maximizes disk space. There are times, however, when the first scheme will not work because some programs write data to the same directory from which they read data. Making the readable files read-only is fine, but you can't make the files that the program will write to read-only. This means that you may get a sharing violation when data is written. If the program writes to unique files as it runs and the files cannot conflict with another invocation of the program, then the first scheme will work fine.

When setting up files as read-only, it is a good idea to create a common directory for programs that are frequently run, giving everyone only RLE (Read Lookup Execute) access to the directory and also making all programs in the directory read-only.

---

Some programs make direct reference to hardware ports or devices which may not exist on a remote node but which do exist on the machine where the software is installed. The most common example are programs which are configured for a specific display device or need a math coprocessor.

Some of these programs allow you to specify a different display setup without having to reinstall the software. Each network user that has a different display screen will use a different display setup.

If you have software that does not provide for these different display setups, then you will need to install different versions of the software for various display devices.

Programs which are not reconfigurable and which continue to make references to nonexistent hardware ports or devices will not run unless you provide corresponding hardware on the remote node. Some modem communications packages fall into this category since they directly interface to the communications port hardware.

## **PROGRAMS WHICH MAKE DIRECT REFERENCE TO HARDWARE**

**PROGRAMS  
WHICH WORK  
ONLY ON  
SPECIFIC DISKS**

There is also a class of programs which address disk software below the DOS level. (e.g. Norton Utilities, CHKDSK) This software cannot be effectively controlled by the network. DOS provides a mechanism for inquiring to see if a disk is addressable at this low level. Such software should make inquiries to determine if it is running on a network and if the disk is addressable at the low level. The DOS CHKDSK command is a good example of this. When it detects that a network disk is being referenced it refuses to run and displays the following message:

**Cannot CHKDSK a Network drive**

Some disk management programs, however, do not perform any inquiries and assume that they are not running on a network. These programs will not run on a network drive. Generally they cause no harm to the system other than locking up the computer. Many disk management software companies have special network versions of their software.

---

There are some programs which are hard coded to use certain disk drives. You may need to make some adjustments to your disk organization when running these programs in a network environment.

For example, suppose a program always accesses drive C: for its files and that the program has been installed on a server. Suppose also that you are located at a workstation and you already have your own drive C:. If you attach the program to drive D:, it will not run because it will try to access its files from drive C:. If you attach the program to drive C:, then your own local files will no longer be available. The solution is to remap your own drive to another drive (D: for example), and then connect drive C: to the network. You can remap your C: drive to another drive by using the DOS SUBST command. For example,

```
SUBST D: C:\           — Drive D: is the same as C:  
NET USE C: \\SERVER\PROGDIR — Drive C: is now a network drive
```

You may also need to change your PATH to specify drive D: instead of drive C:. For example, if your path was:

```
PATH C:\;C:\DOS;C:\APPS;C:\LANTASTIC
```

then you need to change it to:

```
PATH D:\;D:\DOS;D:\APPS;D:\LANTASTIC
```

As a matter of fact, you could always have your real drive C: mapped to another drive by placing the following lines in your AUTOEXEC.BAT file:

```
SUBST D: C\  
PATH D:\;D:\DOS;D:\APPS;D:\LANTASTIC
```

This way, if you ever decide to connect drive C: to the network then you won't have to worry about issuing the SUBST and PATH commands.

---

Because copy protected programs have been designed not to be copied, defeating the copy protection mechanism is in violation of most license agreements. Many copy protected programs may be run on networks if you transfer the copy protection device or disk to the machine from which you want to run the program. This also has the effect of allowing you to run only one copy of the program at a time. It has the advantage of allowing you to keep the program on a central file

**COPY  
PROTECTED  
PROGRAMS**

server without having the program installed on all machines. In fact, you could run a program which required a hard disk from a machine that does not have one.

This chapter will cover the following advanced topics:

- 1) Physical device access.
- 2) Using the network control directory as a shared resource.
- 3) Multiple network control directories.

---

Earlier, you were told about the "P" access control privilege and were told that you should not usually give this privilege. This privilege, when applied to a directory, allows direct physical access of any DOS device referenced within the directory. This direct physical access must be performed through DOS system calls or DOS commands.

Devices referenced in this way allow you to send and receive data directly from the device across the network. No automatic spooling is performed and your program or the server may pause while waiting for data to become available. Therefore, it is recommended that you give physical access only in special applications where you can afford delays. It is not recommended to give physical access to servers which are used for normal file sharing.

To enable physical device access, create a shared directory and add the P access control privilege. You may want to restrict physical access to one group or user. To access a device physically, you need to specify a full network path including the shared directory and the device. For example,

**\\HOST\DIRECT\LPT1**

refers to physical device LPT1 on server HOST. DIRECT is a direct access directory to which P access has been given.

There are several useful applications for direct physical access. The following examples assume that you have already created a physical access directory.

The most impressive and easiest demonstration of physical access is direct access of the remote server's console. For example,

**echo ^GHello there! >\\HOST\DIRECT\CON**

will ring the server's bell and display the text "Hello there!". Of course, you must have been logged into the server before you could reference it in a full network path.

Copying directly to a printer is also possible:

**copy MYFILE \\HOST\DIRECT\LPT1**

---

The server creates all its shared resources in the LANTASTI.NET network control directory. The resources are created in such a way that they can be viewed as standard DOS directories or files. You can attach a disk to the network control directory the same way as you can attach a disk to any other shared disk or directory resource. For example, to attach disk D: to server HOST's network control directory you can issue:

**NET USE D: \\HOST**

## CHAPTER 12 ADVANCED TOPICS

### PHYSICAL DEVICE ACCESS

### USING THE NETWORK CONTROL DIRECTORY AS A SHARED RESOURCE

## MULTIPLE NETWORK CONTROL DIRECTORIES

Notice that you did not specify a shared resource name after \\HOST. Now if you do a directory on disk D:, you will see a list of all the shared resources:

```
Volume in drive D is HOST-DISK
Directory of D:\
.                <DIR>          1-14-88    5:06p
..               <DIR>          1-14-88    5:06p
@IMAGE          450            4-16-88    2:01p
@PRINTER        450            4-09-88    8:34a
@WIDE           450            1-18-88    2:41p
@MAIL           450            1-14-88    5:07p
@NOBANNE        450            1-18-88    2:36p
ROOT            <DIR>          1-14-88    5:13p
ADA             <DIR>          1-15-88    2:19p
DOS             <DIR>          1-15-88    2:20p
DIRECT          <DIR>          1-15-88    5:09p
FLOPPY_A        <DIR>          1-23-88    8:39p
FLOPPY_B        <DIR>          1-23-88    8:39p
                13 File(s) 1548288 bytes free
```

All the shared resources are usable as standard DOS directories or devices. If you wanted access to the server's A: floppy, you would just CD into FLOPPY\_A.

Although you can have multiple network control directories co-existing on one server at a time, only one directory can be active at a time. It may be convenient to have multiple control directories. Some of the reasons for multiple control directories are:

- 1) You may want to perform a network backup and don't want unauthorized users on the network.
- 2) You may want to perform software testing with a different set of shared resources or users.
- 3) You may want to run different configurations during different parts of the day.
- 4) You may want to pre-create a configuration for future use.

Because each network control directory has its own unique set of shared resources, users and spooled entries, you can create totally different looking network configurations. To create a different network control directory, reinstall the network operating system software using the new control directory path (without the disk). The network control directory name is specified on the NET\_MGR command line. For example,

```
A:NET_MGR \SECOND
```

— Place distribution disk in drive A  
— Install software

To manage the new network control directory, specify the directory name on the NET\_MGR command line again:

```
NET_MGR \SECOND
```

When bringing up the server, specify the network control directory on the command line:

```
SERVER \SECOND
```

## CHAPTER 13 ERROR MESSAGES

### NETWORK STARTUP ERRORS

### ERROR MESSAGES FROM REDIRECTOR

You may encounter three classes of errors when running LANtastic NOS:

- 1) Network startup errors
- 2) General errors
- 3) DOS critical errors

Network startup errors occur when starting the network. General errors may occur when you are using the NET menu system or keyboard commands. Network related DOS critical errors may occur any time after the network is running.

---

There are two classes of messages that may be returned by the Redirector and Server:

- 1) Error messages
- 2) Informative messages

Error messages halt the installation of the Redirector or Server. You must correct the problem and retry the command.

The following section lists the messages you may see when bringing up the Redirector.

---

<b>ERROR:</b>	<b>LANtastic (tm) Redirector must be started first CD-ROM or other network redirector present</b>
<b>Meaning:</b>	The LANtastic Redirector must be started before any other kind of Redirector. The Microsoft CD-ROM driver may have been started before the LANtastic Redirector.
<b>Remedy:</b>	Start the LANtastic Redirector before any other redirector. If you have the Microsoft CD-ROM driver, install that after the Redirector.
<b>ERROR:</b>	<b>NETBIOS is not present</b>
<b>Meaning:</b>	The NETBIOS interface is not installed in your computer. The Redirector requires a NETBIOS interface to run.
<b>Remedy:</b>	You must first install the NETBIOS interface. If you are using LANtastic hardware, run the LANBIOS program first. If you are using another vendor's hardware, consult your user's manual to determine how to install the NETBIOS.
<b>ERROR:</b>	<b>Name is already in use by someone else on the network</b>
<b>Meaning:</b>	The machine name you specified when you invoked the Redirector is in use by another machine on the network. Two machines may not have the same network name.
<b>Remedy:</b>	Use another name or reboot the other machine using your name and specify another name.
<b>ERROR:</b>	<b>You must specify a local machine name</b>
<b>Meaning:</b>	You did not specify a machine name on the Redirector command line.
<b>Remedy:</b>	Invoke the Redirector with a machine name as the first argument on the command line.
<b>ERROR:</b>	<b>Redirector must be run with DOS version 3.10 or above</b>
<b>Meaning:</b>	You attempted to run the Redirector with a DOS version below 3.10.
<b>Remedy:</b>	Bring up DOS version 3.10 or higher on your machine before running the Redirector.

## REDIRECTOR INFORMATIVE MESSAGES

## SERVER ERROR MESSAGES

<b>ERROR:</b>	<b>SIZE option must be in the range 512 to 16384</b>
Meaning:	You specified a SIZE= value that was not in the range 512 to 16384. Each buffer may not be smaller than 512 bytes or larger than 16384 bytes.
Remedy:	Reissue the REDIR command with a SIZE= value in the proper range.
<b>ERROR:</b>	<b>BUFFERS option must be in the range 1 to 64</b>
Meaning:	You specified a BUFFERS= value that was not in proper range. You must have at least 1 buffer or no more than 64 buffers.
Remedy:	Reissue the REDIR command with a BUFFERS= value in the proper range.
<b>ERROR:</b>	<b>Total buffer space (BUFFERS*SIZE) may not exceed 32768</b>
Meaning:	The total buffer space computed by taking the BUFFERS= value and multiplying it by the SIZE= value may not exceed 32768 bytes.
Remedy:	Reduce the size of the BUFFERS= value or the SIZE= value until the total buffer space is less than 32768.
<b>ERROR:</b>	<b>LOGINS option must be in the range 1 to 255</b>
Meaning:	You specified a LOGINS= option that was not in the range 1 to 255. The redirector must be started with the capability to log into at least one server or no more than 255 servers.
Remedy:	Reissue the REDIR command with a LOGINS= value in range.
<b>MESSAGE:</b>	<b>LANtastic (tm) Redirector V2.20 - Copyright (C) 1988 by ARTISOFT Inc.</b>
Meaning:	This is the greeting text that the Redirector displays whenever it is invoked. The version number may vary from the version you have.
<b>MESSAGE:</b>	<b>— LANtastic (tm) Redirector Installed —</b>
Meaning:	The Redirector has been successfully installed.
<b>MESSAGE:</b>	<b>LANtastic (tm) Redirector is already started with machine name NNNNN</b>
Meaning:	You previously issued a REDIR command and the Redirector is already running. The name NNNNN is the machine name you specified when you first started the Redirector.
<b>ERROR:</b>	<b>REDIR must be run before SERVER is started</b>
Meaning:	You must run the network redirector, REDIR, before starting the server.
Remedy:	Run REDIR first.
<b>ERROR:</b>	<b>Server cannot be installed after PRINT</b>
Meaning:	You cannot bring up the Server after you have installed the DOS PRINT program. If you need to print, then you should use the NET PRINT command.
Remedy:	Reboot your system and do not run PRINT before starting the Server.
<b>ERROR:</b>	<b>Can't locate network control directory XXXXXXX</b>
Meaning:	The Server cannot locate it's network control directory

XXXXXX. You either specified a network control directory when you started the server and the network control directory does not exist or your default network control directory cannot be located.

**Remedy:** If you are specifying a network control directory on the SERVER command line, then make sure that it exists. If you are not specifying a network control directory on the SERVER command line, then you should run the NET\_MGR program and reinstall your software.

**ERROR: Your NETBIOS Is Incompatible**

**Meaning:** The server has determined that the NETBIOS you are trying to use does not fully conform to the NETBIOS definition.

**Remedy:** You must run a NETBIOS which fully conforms to the NETBIOS definition.

**ERROR: Not enough memory - Reduce tasks or buffer size.**

**Meaning:** You do not have enough memory for the server to allocate its buffers. The server allocates a network buffer for each network task. If you specify a large buffer size and a large number of tasks, then you may exceed available memory.

**Remedy:** Reduce the network buffer size or the number of network tasks.

**ERROR: Redirector version does not match server version.**

**Meaning:** The version of the redirector (REDIR.EXE) that you ran is not compatible with the server (SERVER.EXE) that you are trying to run.

**Remedy:** Make sure that you run the same versions of both REDIR.EXE and SERVER.EXE.

**ERROR: Insufficient NETBIOS resources for this server configuration. Restart NETBIOS with higher sessions and NCBs.**

**Meaning:** The NETBIOS has not been started with sufficient NCBs and/or sessions resources relative to the maximum number of logins you allowed.

**Remedy:** Restart your NETBIOS with a higher number of NCBs and/or sessions. A general formula for computing the number of NCBs and sessions is:  
NCBs = Maximum logins + 8, Sessions = Maximum logins + 8

**ERROR: NETBIOS adapter n is not present.**

**Meaning:** Where "n" is the adapter number not present. The maximum number of adapters listed in the server startup parameters menu exceeds the actual number of adapters in the server. You may also get this message if your adapter malfunctions.

**Remedy:** Set the maximum number of adapters in the server startup menu to the actual number of adapters present in your server.

---

**MESSAGE: LANtastic (tm) Server V2.20 - Copyright (C) 1988 by ARTISOFT Inc.**

**Meaning:** This is the greeting text that the Server displays whenever it is invoked. The version number may vary from the version you have.

**SERVER  
INFORMATIVE  
MESSAGES**

## GENERAL ERRORS

<b>MESSAGE:</b>	<b>— LANtastic (tm) Server Installed —</b>
Meaning:	The Server has been successfully installed.
<b>MESSAGE:</b>	<b>LANtastic (tm) Server is already started with machine name NNNNNNNN</b>
Meaning:	You previously issued a SERVER command and the Server is already running. The name NNNNNNNN is the machine name you specified when you first started the network.

---

General errors may occur when using the NET keyboard commands or the NET menu system. While using the NET menu system you may get detailed help for the error message that was encountered by pressing the ? key. In addition to the following list of error messages, you may get DOS related error messages. You should consult your DOS manual for these.

<b>ERROR:</b>	<b>Cannot locate network name</b>
Meaning:	You attempted to login to a Server which is not running the network software or you specified a Server in a network path that you are not logged into.
Remedy:	If you are attempting a login, make sure that the remote Server is running the networking software. If you are specifying a network path such as in a NET USE command, make sure that you are logged into the server name (\\name).
<b>ERROR:</b>	<b>Duplicate redirection or login to network node ???????</b>
Meaning:	You are either attempting to login to a server you already logged into or you are attempting to redirect a disk that is already redirected.
Remedy:	If you are attempting a login, then you must log out of the server before you can log back in. If you are attempting to redirect a drive, you must first cancel your redirection to the drive before specifying a new redirection.
<b>ERROR:</b>	<b>Invalid network version</b>
Meaning:	You are attempting to log into a server whose network version is not compatible to yours.
Remedy:	Make sure your network version is the same as the server's.
<b>ERROR:</b>	<b>Invalid username or password</b>
Meaning:	You are attempting to log into a server with a username or password which is not valid.
Remedy:	Make sure that you have an account created on the server with the username and password that you are specifying. If you have forgotten your password, then the Network Manager on the server needs to run NET_MGR and assign you a new password.
<b>ERROR:</b>	<b>Network node ??????? is not listening</b>
Meaning:	The node ??????? has not started the Server program and therefore is not listening for login requests. The remote node may also be running incompatible network software.
Remedy:	Make sure you are running the Server program on the node to which you are attempting to login. Also make sure that the Server is running the same version of the network operating system.

<b>ERROR:</b>	<b>Network request not supported</b>
Meaning:	A request has been made to the network which is not supported by this version of the software.
Remedy:	Make sure that all network nodes are running the correct version of the network operating system.
<b>ERROR:</b>	<b>The network is busy</b>
Meaning:	Your network request was not processed due to heavy network activity. If this message persists, you may have faulty network hardware.
Remedy:	Retry the network operation.
<b>ERROR:</b>	<b>The network name was not found</b>
Meaning:	You have not logged into the server whose name you are using in a network path.
Remedy:	Make sure the you are logged into any server you are attempting to access.
<b>ERROR:</b>	<b>Too many redirections or logins to network node ????????</b>
Meaning:	Your login attempt to server ??????? cannot be processed because:
	<ol style="list-style-type: none"> <li>1. The server's maximum login limit has been exceeded.</li> <li>2. Your Redirector's maximum login limit has been exceeded.</li> <li>3. Your username maximum login limit has been exceeded.</li> </ol>
Remedy:	For each of the above possible errors, perform one of the following corresponding actions:
	<ol style="list-style-type: none"> <li>1. Run the NET_MGR program to change the maximum logged in users.</li> <li>2. Restart your redirector with a larger LOGINS= value specified on the command line.</li> <li>3. Run NET_MGR and alter the account you are attempting to log in with to allow a larger number of concurrent logins. If you are running a starter kit version of the networking software, increasing the above limits may have no effect.</li> </ol>
<b>ERROR:</b>	<b>You have been denied access on network node ????????</b>
Meaning:	Your request to remote node ??????? has been denied because you lack sufficient privileges for the request.
Remedy:	Make sure you are logged into the server with a username that has the appropriate privileges. For example, you must have the Q privilege to control the despooler.
<b>ERROR:</b>	<b>The network adapter has malfunctioned.</b>
Meaning:	You specified an adapter number with the NET LOGIN command that is not valid or is not an operating network adapter.
Remedy:	Make sure that the adapter you specify exists or is operational.

---

You are probably already familiar with DOS critical error messages. These messages are displayed when an abnormal error occurs such as attempting to write to a write protected disk or a floppy drive door being left open. For example,

**Not ready error reading drive A**  
**Abort, Retry, Ignore?**

When the LANtastic network is running, you may get DOS critical error messages

## DOS CRITICAL ERRORS

that you have never seen before. The messages are listed below with their meaning and remedy. Some messages include the machine name of the network node that was being referenced when the error occurred.

**ERROR: FCB unavailable**

**Meaning:** Your program is using file control blocks (FCBs) and it has used more than are currently available.

**Remedy:** Select Abort to abort your program and then edit your CONFIG.SYS file and increase the value of the FCBS= line. If you don't have a FCBS= line in your CONFIG.SYS file, then you will need to add one. For example, FCBS=24,8.

**ERROR: Incompatible network node ????????**

**Meaning:** The remote node's software is not compatible with the LANtastic network operating system.

**Remedy:** Make sure you are running compatible networking software across the network. Also make sure you are running the same LANtastic NOS on all nodes.

**ERROR: Incorrect response received from network node ????????**

**Meaning:** Node ???????? has sent an invalid response to a network request or you have sent an invalid request to node ????????

**Remedy:** Make sure you are running compatible networking software across the network. Also make sure you are running the same LANtastic NOS on all nodes. This error may also indicate a faulty NETBIOS.

**ERROR: Lock violation**

**Meaning:** You are attempting to access data which has been locked from access. This usually indicates that some application program has locked a region of a file to prevent concurrent updates to the file. This error may occur when you attempt to copy a database file which is currently being updated.

**Remedy:** This error indicates that you are accessing a file which you should not normally access. In most cases, you should specify A for abort. If you are doing a file copy, you can try R to retry the operation.

**ERROR: Network data fault**

**Meaning:** The data you are sending to server cannot be stored on the server's disk. This error will occur if the server's disk space is exhausted or you reconnected to the server after getting a "connection broken" message.

**Remedy:** If the error occurred due to insufficient disk space, then free up some disk space on the server and retry the disk operation. If the error occurred because you reconnected to the server, then you must specify Abort or Fail (Ignore).

**ERROR: Server connection to network node ??????? broken**

**Meaning:** You have been disconnected from the server. You may be disconnected for one of several reasons:

1. The server may have gone down (crashed).
2. The server may have been shutdown or turned off.
3. The cabling between you and the server may have been disconnected.
4. The networking hardware or NETBIOS is defective.
5. An application program on the server or your computer has

Remedy:	restarted the NETBIOS. If the server is no longer running, restart the server and then type R (Retry) to attempt to reconnect to the server. If the server is still running, make sure that the cabling is not disconnected. If you specify Abort or Fail, you will not be automatically reconnected to the server. Your redirected drives and printers, however, will still be referencing the disconnected server. You may elect to reconnect later to the server when you get another "connection broken" critical error. If you really do not want to be connected to the server any more at this point, you must perform a logout (E.g NET LOGOUT).
<b>ERROR:</b> Meaning:	<b>Sharing buffer overflow</b> The buffer space allocated to the SHARE program has been exceeded.
Remedy:	When starting the SHARE program specify a larger filespace. For example, SHARE /F:4096.
<b>ERROR:</b> Meaning:	<b>Sharing violation</b> You are attempting to access data or a program concurrently with another user on the network.
Remedy:	There are many possible causes for this error and therefore a general remedy does not exist. However, here is a list of common remedies: <ol style="list-style-type: none"> <li>1. Press R to retry the operation.</li> <li>2. Change the file attribute for all shared files to read-only. You can use the DOS ATTRIB command for this. Generally, you should make any programs that you are going to share on the network read-only.</li> <li>3. Don't run SHARE on the server. You should only do this if the programs you are running are not going to be writing to the same files.</li> <li>4. Use a username which has the peer (P) privilege to bypass some SHARE functions.</li> </ol>
<b>ERROR:</b> Meaning:	<b>The NETBIOS command limit has been exceeded</b> The NETBIOS may be started (or reset) with a specific number of concurrent network command block (NCBs) that it can process. If the number of concurrent commands is exceeded while the network is being accessed, then this message is displayed. The LANtastic network operating system uses far less than the default number of NCBs so this error usually means that another application program has used so many NCBs that none are available for LANtastic.
Remedy:	If you are running another NETBIOS application, make sure that sufficient NCBs have been allocated when the NETBIOS is started. If you are running with LANtastic hardware or an ARTISOFT NETBIOS, you can specify this at startup time with the NCBS= command line option.
<b>ERROR:</b> Meaning: Remedy:	<b>The network adapter has malfunctioned</b> A hardware problem exists with the network adapter card. Consult your hardware technical manual for corrective actions.
<b>ERROR:</b> Meaning:	<b>The network name has been deleted</b> An application program has deleted the network name with

which the network was started. The network cannot function if its network name is deleted.

Remedy: Don't allow application programs to delete NETBIOS names which they have not created.

**ERROR:** **The session limit has been exceeded**

Meaning: The NETBIOS is configured for a certain number of sessions at startup time or when it is reset. Each login corresponds to 1 session. You have either logged into too many servers, too many remote nodes have logged into you or an application program has used up all available sessions.

Remedy: You must specify a larger number of sessions at NETBIOS startup time. If you are using LANtastic hardware or an ARTISOFT NETBIOS you can increase the number of sessions with the SESSIONS= command line option.

**ERROR:** **Unexpected network error from network node ???????**

Meaning: Node ??????? has returned an unexpected error for a network request.

Remedy: Make sure you are running compatible networking software across the network. Also make sure you are running the same LANtastic software on all nodes. This error may also be caused by a faulty NETBIOS.

Listed below are sample autoexec.bat and config.sys files for a server which boots from its hard disk and a workstation which boots from a floppy disk. It is assumed in these examples that the network software for a server with redirector has been installed on the server's hard disk C: (SERVER.EXE, REDIR.EXE), and that the network software for a redirector has been installed on the workstation boot diskette (REDIR.EXE). It is also assumed that a printer is attached to the server's physical port LPT1. These files are designed for a network in which the server boots before the workstation or at the same time.

The NET\_MGR program must be used on the server to enter USER1 as a user with password PASS1 and USER2 as a user with password PASS2. NET\_MGR must be used to make the root directory of the server's hard disk and the server's printer available as a shared resource for the network, called ROOT and @PRINTER, respectively.

In these sample batch files, lines beginning with "::" are comment lines. These lines may be omitted from the batch file. In the sample config.sys files, parentheses enclose comments. These comments MUST be omitted from the actual file.

---

```
:: Set path to root, \DOS and \LANtastic subdirectories
PATH C:\;C:\DOS;C:\LANTASTI
:: Start up the NETBIOS interface
LANBIOS
:: Implement record and file locking
SHARE
:: Start up the redirector. Call machine "HOST". You can use any name.
REDIR HOST
:: Start up the server
SERVER
:: Login to the server "HOST"
NET LOGIN \\HOST USER1 PASS1
:: Attach LPT1 to server's printer through the network
NET USE LPT1 \\HOST\@PRINTER
:: Display current state of the network
NET SHOW
```

---

```
:: Set path to LANtastic sbdirectory
PATH A:\LANTASTI
:: Start up the NETBIOS interface
LANBIOS
:: Start up the redirector. Call machine "REMOTE". You can use any name.
REDIR REMOTE
:: Mark beginning of login loop with ":"
: Login Loop
:: Attempt to login to server "HOST"
NET LOGIN \\HOST USER2 PASS2
:: Loop back to batch file line ":Login Loop" if login attempt fails
IF ERRORLEVEL 1 GOTO LOGIN_LOOP
:: Attach C: to server's hard disk C:
NET USE C: \\HOST\ROOT
:: Attach LPT1 to server's printer
NET USE LPT1 \\HOST\@PRINTER
:: Set path to C:'s root and \DOS directories and to floppy's \LANtastic directory
PATH C:\;C:\DOS;A:\LANTASTI
:: Display current state of the network
NET SHOW
```

## APPENDIX I SAMPLE BATCH FILES

### SAMPLE SERVER AUTOEXEC.BAT

### SAMPLE AUTOEXEC.BAT FOR A WORKSTATION THAT BOOTS FROM A FLOPPY DISK

**SAMPLE  
CONFIG.SYS  
FOR SERVER**

**BUFFERS=99** (Set DOS buffers to 99)  
**FILES=50** (Set number of files DOS may open concurrently to 50)  
**LASTDRIVE=N** (Allocate drive letters up to N)  
**FCBS=16,8** (Set the maximum number of file control blocks to 16 and  
the maximum number of file control blocks which can be  
closed automatically to 8)

---

**SAMPLE  
CONFIG.SYS FOR  
WORKSTATION**

**BUFFERS=40** (Set DOS buffers to 40)  
**FILES=20** (Set number of files DOS may open concurrently to 20)  
**LASTDRIVE=N** (Allocate drive letters to N)

For more sample batch files, see the **SAMPLE** directory on your distribution  
diskette.

## GENERAL RELEASE INFORMATION AND COMMON PROBLEMS

NOTE: If you are having problems, read the COMMON PROBLEMS section at the end of this document.

Your distribution disk contains:

LANtastic (tm) Network Operating system version 2.53  
LANtastic (tm) LANBIOS software version 1.91  
LANtastic (tm) NETBIOS Setup program (NBSETUP) version 1.0  
LANtastic (tm) Pop-up Utility Package (LANPUP) version 1.1

The LANtastic network operating system version number will contain a character following it. The character may be an s, u, or g. The meaning of the characters is shown below:

s Starter kit version  
u Unlimited version for use only with ARTISOFT's LANBIOS  
g Generic unlimited version for use on any NETBIOS  
(including ARTISOFT's NETBIOS)

EXAMPLES: 2.53s, 2.53u, 2.53g

Major features of this release are as follows:

### LANtastic NOS:

1. Network now supports DOS version 4.00 and above.
2. New NET commands:
  - NET SEND (sends unsolicited messages)
  - NET RECEIVE (receives unsolicited messages)
  - NET MAIL (sends mail)
  - NET POSTBOX (checks mail box for mail)
3. Enhanced NET SHOW lists all available servers.
4. All available servers listed in NET menus.
5. Increased printer despooling speed.

See LANTASTI.DOC for more documentation and manual updates.

### LANtastic LANBIOS:

1. Speed improvement.
2. Reduction in memory size.
3. Cosmetic enhancements.

See LANBIOS.DOC (on disk) for more documentation and manual updates.

### LANtastic NBSETUP:

See NBSETUP.DOC for documentation.

### LANtastic LANPUP:

See LANPUP.DOC for documentation.

NOTE: When upgrading from previous versions, you may need to run

NET\_MGR and specify the number of network tasks that you wish to allocate. See your NOS user's manual for further details.

LANBIOS version 1.91 and above IS NOT compatible with previous versions of LANBIOS. You should upgrade all nodes to the new version. This is automatically done when you use the "Install Software" option in the NET\_MGR program.

You may run LANBIOS version 1.91 with older versions of the network operating system.

The NBSETUP and LANPUP programs are not automatically copied from the distribution disk since they may not be needed by all users.

NOTE: Consult the following on-line documentation files for more information on enhancements to several software products:

LANTASTI.DOC	For REDIR, SERVER, NET and NET_MGR programs
LANBIOS.DOC	For LANBIOS program
NBSETUP.DOC	For NBSETUP program
LANPUP.DOC	For LANPUP program

#### COMMON PROBLEM

**PROBLEM:** I can't seem to login to more than two machines. It doesn't matter which two. I get the error message, "Duplicate redirection or login to network node..."

**REMEDY:** 1) First, check version numbers on all your computers by typing "REDIR" at the DOS prompt. Each computer should be running a 2.nnu version in order to login more than two times.

2) Next, on each workstation that will be logging into more than the default number of two servers, you must add: LOGINS=n where n is the number of logins that you will be attempting from that workstation. The syntax is as follows:

REDIR HOST LOGINS=n

For more information, see page 7-2 of your LANtastic User's Manual.

3) If you are logging in more than once using the same Username and Password, you must specify the number of concurrent logins for that username. See your LANtastic NOS User's Manual page 6-5 for more information.

**PROBLEM:** My application program won't print until I exit the program.

**REMEDY:** Add the line: NET LPT TIMEOUT 10 to your network batch

file or at the DOS prompt. See page 10-1 of your LANTastic NOS User's Manual for more information.

**PROBLEM:** My application program now prints without exiting on the server, but it still won't print until I exit the program on the workstation.

**REMEDY:** You must put the NET LPT TIMEOUT 10 on all your workstations and servers that are using a network printer.

**PROBLEM:** I am able to print fine from all my workstations, but once I print one time from a workstation I can no longer print from the server where the printer is actually located.

**REMEDY:** If you are using the server's printer as a shared resource you must log the server into itself and issue a NET USE LPTn command just as you would at the workstations. This is a safety feature so that you will not get intermixed print jobs from the server printing locally and workstations printing through the spooler. See page 10-3 of your LANTastic NOS User's Manual for more information.

**PROBLEM:** I have my banner page "enabled" but all I get is a blank page.

**REMEDY:** The banner page prints to a width specified in "page width." The default page width is equal to 0. Set your page width equal to 80 for most printing.

**PROBLEM:** I think I have set up all my NET USE LPT1 \\HOST\@PRINTER statements correctly on my workstation and server but it still won't print.

**REMEDY:** In NET\_MGR under "server startup parameters" the option "despooling" should be "enabled." Once you have changed that (or any other option in the "server startup parameters") you will need to reboot your server.

**PROBLEM:** I tried to delete a file from the print queue and it says "deleted" but it will not go away.

**REMEDY:** You must "halt" the queue and then you may delete print jobs. Then select "start" to start the print queue again.

**PROBLEM:** I keep getting "internal stack failure, system halted."

**REMEDY:** You are using DOS 3.2. DOS 3.2 has errors in the

internal stack handler. Use DOS 3.1 or 3.3.

**PROBLEM:** I'm using a VGA monitor and I get an error message from LANBIOS that says:

NO LANTastic hardware present at this address. Check ADDR jumper on board or ADDRESS= command line option.

**REMEDY:** Some VGA adapters make you choose between running in an 8-bit mode and the faster 16-bit mode. Others have an auto-switching mode which automatically switches between the 8-bit and 16-bit modes as required. The first type (those that make you choose between the 8-bit and 16-bit modes) uses the memory between C000 and DFFF. This means that you cannot use the 0,2,4, or 6 ADDR settings on the LANTastic adapter. In this case, you have 2 choices:

i.) Reconfigure your VGA board to work in the 8-bit mode (which frees up ADDR setting 2 and 6). Then use ADDR setting 2 or 6 for the LANTastic adapter.

Or

ii.) Run the VGA adapter in 16-bit mode and use LANTastic adapter jumper setting 1 or 5.

If your VGA adapter has an auto-switching mode, simply using that mode will eliminate any memory address conflicts.

**PROBLEM:** I am not able to use a tape backup system to backup the LANTASTI.NET directory on a server.

**REMEDY:** The LANTASTI.NET directory contains a file called QCONTROL that is opened for exclusive use by the network.

You must tell your backup software to exclude this file, or tell it to perform a "read only" backup. You can also try backing up without installing the DOS SHARE program.

**PROBLEM:** When I run the SERVER program I get the error message, "Insufficient NETBIOS resources for this server configuration....."

**REMEDY:** If you are running NOS version 2.49, then you must specify SESSIONS and NCB's on the command line. See the section entitled "LANTastic LAN Adapter User's Manual Update" for information regarding calculating the correct number of SESSIONS and NCB's. If you are using a newer version, then simply raise the NCB and SESSION values to higher than the default values of 32 and 32.

# LANTASTIC NETWORK OPERATING SYSTEM USER'S MANUAL UPDATES

\*\*\*\*\*

\*\*\* (Page 2-1)

\*\*\* Change all references of "DOS 3.1" to "DOS 3.1 or above"

\*\*\*\*\*

\*\*\* (Page 6-17)

\*\*\* Replace the server startup parameters menu with the following

\*\*\* (which includes the Remote Boot option which will be made

\*\*\* available in the next release):

Press Enter to modify
Maximum users
Network buffer
Maximum adapters
Network tasks
Send Server ID
Remote Booting
Floppy direct
Despooling
Audit server up
Audit logins
Audit logouts
Audit queueing
Audit printing
Audit user entry
Access allowed
Access denied

Server installation window	
Maximum users	120
Network buffer	10240
Maximum adapters	1
Network tasks	31
Send Server	ENABLED
Remote Booting	DISABLED
Floppy direct	ENABLED
Despooling	DISABLED
AUDITING	
Server up	ENABLED
Logins	ENABLED
Logouts	ENABLED
Queueing	ENABLED
Printing	ENABLED
User Entry	ENABLED
Access allowed	-----
Access denied	-----

\*\*\*\*\*

\*\*\* (Page 6-20)

\*\*\* Before the "FLOPPY DIRECT" section add the following:

SEND SERVER ID

-----

SEND SERVER ID      Default: ENABLED

This option allows you to specify whether the server should periodically broadcast its identification to all nodes on the network. When a server broadcasts its ID, remote nodes will be able to see the server's name even if they haven't logged into it. If Send Server ID is disabled, then remote nodes will not see the server, but they can still log into it if they know its name.

You can toggle between ENABLED and DISABLED by pressing ENTER.

## REMOTE BOOTING

---

NOTE: This command is not yet available. It will be made available in the next release.

REMOTE BOOTING      Default: DISABLED

This option allows you to specify whether the server should support remote booting. Remote booting allows diskless workstations to boot directly across the network using the NETBIOS. Only one boot server is active at any time on the network, although multiple servers may have the Remote Booting option enabled. You will need to have created a boot image and specified a sufficiently large network buffer size before this option can be enabled.

The Remote Booting option can be changed from DISABLED to Read-Only or Read-Write. When set to Read-Only, remote booting is enabled, but remote nodes can only read the boot image. When set to Read-Write, remote booting is enabled and remote nodes can both read and write to the boot image.

Generally, if you want Remote Booting enabled, you should set it to Read-Only. You may want to set Remote Booting to Read-Write if you wish to alter the boot image remotely. When multiple nodes are writing to the boot image, you should not run with Remote Booting set to Read-Write, since your boot image may be corrupted.

\*\*\*\*\*

\*\*\* (Page 6-8)

\*\*\* In the section entitled MODIFYING EXISTING SHARED DISKS OF DIRECTORIES,  
\*\*\* under the LINK/ACL for ROOT menu, replace the A in the guest access control list with R.

\*\*\*\*\*

\*\*\* (Page 7-2)

\*\*\* In the section entitled RUNNING THE REDIRECTOR, in the **machine-name**  
\*\*\* paragraph, insert the following as the last sentence:

The machine name must be unique, and must contain fifteen or fewer characters.

\*\*\*\*\*

\*\*\* (Page 7-3)

\*\*\* After "increase this value." at the top of the page, insert  
\*\*\* the following:

You may also want to increase the LOGINS= value if you have multiple servers and you wish to select among several available servers without having to remember their names. REDIR maintains a list of logged in and non-logged available servers (which is never larger than the LOGINS= value). These servers may be viewed using NET SHOW or the NET menu.

\*\*\*\*\*

\*\*\* (Page 7-3)

\*\*\* Add the following new error level codes for the redirector:

- 10 - Software licensed for ARTISOFT NETBIOS only
- 11 - Can't add network name - NETBIOS error

\*\*\*\*\*

\*\*\* (Page 7-5)

\*\*\* Add the following new error level codes for the server:

- 13 - Software licensed for ARTISOFT NETBIOS only

\*\*\*\*\*

\*\*\* (Page 8-1)

\*\*\* In the "Logging In or Logging Out" section, replace the  
\*\*\* paragraph that begins "This is a list of servers that you are  
\*\*\* currently logged into" with:

This is the list of servers that you are currently logged into.  
Server names preceded by "\\\" are servers that you are logged  
into; server names surrounded by "()" are servers that you are  
not logged into but which are available on the network for you to  
log into. If the screen is blank, or if all the server names are  
surrounded by parentheses, then you are not currently logged into  
any servers on the network.

The number of servers you will see in this menu will never exceed  
the LOGINS=n switch value when you started REDIR. If, for  
example, 10 servers existed on the network and REDIR was started  
with the default of 2 LOGINS, then only 2 servers would appear on  
the menu.

\*\*\*\*\*

\*\*\* (Page 8-2)

\*\*\* Add the following to the end of the "Specifying a Server  
\*\*\* Name" section:

If the server you wish to log into is already on the list, but is  
surrounded by parentheses (meaning that the server is on the  
network but that you are not logged into the server), then you  
can select the server name and press ENTER. Doing so will bypass  
the "Enter the SERVERNAME" menu (which you would get if you  
pressed INSERT) and go right to the "Enter your USERNAME" menu.

\*\*\*\*\*

\*\*\* (Page 9-3)

\*\*\* Change the NET HELP example output to include the new MAIL,  
\*\*\* POSTBOX, SEND, RECEIVE, and UNLINK commands

NET Usage:

```
NET LOGIN \\Server_name Username Password [Adapter#]
NET LOGOUT \\Server_name
NET USE D: \\Server_name
NET USE D: \\Server_name\Path\...\Path
NET USE LPTn: \\Server_name\@Device      (n=1,2 OR 3)
NET UNUSE D:
```

NET PRINT(/B) filename device {comment} {copies}  
NET CLOCK \\Server\_name  
NET LPT [COMBINE,FLUSH,SEPARATE]  
NET LPT TIMEOUT t (t=time in seconds)  
NET QUEUE [START,STOP,HALT,PAUSE,SINGLE,RESTART] \\Server\_name  
NET AUDIT \\Server\_name reason "audit text string"  
NET MAIL filename \\Server\_name {recipient} {"comment text string"}  
NET POSTBOX  
NET SEND Machine-name {"comment text string"}  
NET RECEIVE  
NET UNLINK  
NET SHOW

NET with no arguments will use the window interface

\*\*\*\*\*

\*\*\* (Page 9-6)

\*\*\* Add the new NET MAIL and NET POSTBOX command:

NET MAIL

-----

NET MAIL file(s)-to-mail \\server-name [recipient] ["comment text string"]

The NET MAIL command may be used in place of the NET menus to send mail to a user. The arguments of the command are explained below:

file(s)-to-mail	A file path to send as mail. You may use wildcard characters. You may specify CON as the file path, in which case you will be able to type in text from the console (terminated by ^Z).
\\server-name	The name of the server to whom you wish to send the mail.
recipient	The person or persons who are to receive mail. You may use an asterisk (*) to specify an incomplete name. The asterisk is useful if you want to send mail to a particular group of people with similar user names (see examples below). The question mark (?) cannot be used as a wildcard. If you omit the recipient, then the mail is sent back to you.
comment	Optional comment text that will be included in the mail header.

EXAMPLES:

NET MAIL memo12 \\HOST ADMIN-\* "New meeting schedule"

NET MAIL \*.let \\BIG-SERVER MIKE "All my letters"

NET MAIL CON \\ACCOUNTING  
Remember to pick up Sally from dance class

RN2-4

2

## NET POSTBOX

-----

### NET POSTBOX

The NET POSTBOX command will check the mail queues of all logged in servers for mail destined for you. You will then be notified of any mail that is pending. If no mail is pending for you, you will receive no message.

#### EXAMPLE:

NET POSTBOX

displays

You have 2 mail messages on server \HOST  
You have 3 mail messages on server \ACCOUNTING

\*\*\*\*\*

\*\*\* (Page 9-10)

\*\*\* Insert the new NET RECEIVE and NET SEND commands before NET

\*\*\* SHOW

## NET RECEIVE

-----

### NET RECEIVE

The NET RECEIVE command displays the last received unsolicited message. When an unsolicited message is received, you will receive 3 short beeps. To view the message, issue a NET RECEIVE command. The message that was received is then displayed, and is prefixed by the machine name from which the message originated.

You do not need to be logged into any server to receive the message.

#### EXAMPLE:

NET RECEIVE

HOST -- Please call me at extension 162

## NET SEND

-----

NET SEND machine-name [comment]

The NET SEND command sends an unsolicited message to a node on the network. Neither you nor the user at the machine to which the message is being sent need to be logged into a server to receive the message. The recipient of the message will receive 3

short beeps when the message arrives.

NOTE: The message is sent using the NETBIOS datagram facility. This facility does not guarantee that a message will be sent correctly, nor does it guarantee that your message will be received at all.

No checking is performed to guarantee that the machine to which you are sending exists.

To use this messaging facility, you need only have the redirector (REDIR.EXE) installed.

The arguments of the command are explained below:

**machine-name** The name of the machine that is to receive the message. This name is the same one used when REDIR is installed. You may use an asterisk (\*) to specify a partial machine name.

**comment** Optional text that will be sent to the recipient.

#### EXAMPLES:

NET SEND CAD-386 "Do you want these plots?"  
This message above would be sent to the machine named CAD-386

NET SEND \* "Does anyone have Dr. Gray's phone number?"  
This message above would be sent to all machines

NET SEND AT\* "hello"  
This message would be sent to all machines whose names begin with AT.

\*\*\*\*\*

\*\*\* (Page 9-10)

\*\*\* Change the NET SHOW example output to include the following  
\*\*\* new "Available Server:" message:

LANtastic (tm) Connection Manager - V2.53 (C) Copyright 1989  
ARTISOFT, Inc.

Machine HOST is being used as a Redirector and a Server

File and record locking currently ENABLED

LPT Timeout: 0 Seconds

Logged into: \\ACCOUNTING

Logged into: \\MAIN-SERVER

Logged into: \\HOST

Available Server: \\CAD-386

Available Server: \\AT-ROOM-112

Disk D: is redirected to \\MAIN-SERVER\CD-ROM

Device PRN is redirected to \\HOST\@PRINTER

\*\*\*\*\*

\*\*\* (Page 9-10)

\*\*\* Insert the new NET UNLINK command before NET UNUSE

NET UNLINK

RN2-6

-----  
NOTE: This command is not yet available. It will be made available in the next release.

The NET UNLINK program is used to break a redirected drive connection that was established during remote booting. When issued, this command breaks both drive A: and drive B: connections. (A: and B: both refer to local drives.)

When a computer is remotely booted (through NETBIOS), local drives A: and B: are redirected to the server's floppy disk image. Any references to A: or B: are made to the server's floppy disk image and not to the local drives A: or B:.

Generally, before issuing a NET UNLINK command, you should start the network and attach to any network drives.

#### EXAMPLE:

#### NET UNLINK

\*\*\*\*\*

\*\*\* (Page 11-1)

\*\*\* Change the text "serve,r" near the middle of the page to  
\*\*\* "server,"

\*\*\*\*\*

\*\*\* (Page 11-2)

\*\*\* Add the following text after "BUFFERS=" in item 4:

... in the server's CONFIG.SYS file ...

\*\*\*\*\*

\*\*\* (Page 12-1)

\*\*\* Add the following to the end of "Physical Device Access"  
\*\*\* section:

When using physical access, you will not be able to use a physical printer device that has been redirected via NET USE. To use the physical device you must NET UNUSE it first.

\*\*\*\*\*

\*\*\* (Page 13-1)

\*\*\* Add the following new redirector error messages (in proper  
\*\*\* alphabetic sequence):

ERROR: Can't add network name - NETBIOS error nnHH

Meaning: The redirector can't add the machine name you specified on the command line because of a NETBIOS error. The NETBIOS error code nn (hex) is also returned.

Remedy: If the error code is 09H then the NETBIOS has an insufficient number of NCB's. You may need to issue the REDIR command several times until the redirector

is installed. To prevent this error make sure the NETBIOS has as sufficient number of NCB's when it is first started.

Other error codes either indicate a problem with the NETBIOS or the hardware. Call the Artisoft Technical Support section if you are unable to solve the problem.

**ERROR:** This software is licensed for use only with an ARTISOFT NETBIOS.

**Meaning:** You are attempting to run the LANtastic network software with a NETBIOS that is not supplied by ARTISOFT.

**Remedy:** You must purchase a different version of the network software.

\*\*\*\*\*

\*\*\* (Page 13-2)  
\*\*\* Add the following new server error messages (in proper alphabetic sequence):

**ERROR:** Badly formatted server configuration file - Run NET\_MGR

**Meaning:** Your server startup configuration file is not formatted correctly for this version of the network software. You have upgraded to a newer version of the network operating system or your configuration file is corrupted.

**Remedy:** Run the NET\_MGR program and alter any invalid server startup parameter values to valid values. For example, if you are installing this new version over a version earlier than 2.49 (which did not include the Network Tasks option), then Network Tasks will be assigned a value of 0. You need to assign the Network Tasks option at least a value of 1.

**ERROR:** This software is licensed for use only with an ARTISOFT NETBIOS

**Meaning:** You are attempting to run the LANtastic network software with a NETBIOS that is not supplied by ARTISOFT.

**Remedy:** You must purchase a different version of the network software. The version you have is sold only in conjunction with an ARTISOFT NETBIOS.

\*\*\*\*\*

\*\*\* (Page 13-3)  
\*\*\* Change the text "ahigher" about two-thirds of the way down the page to "a higher"

\*\*\*\*\*

\*\*\* (Page 13-4)

\*\*\* Add the following general error messages (in proper  
\*\*\* alphabetic sequence):

**ERROR:** The network adapter has malfunctioned

**Meaning:** The adapter number that you specified to log in through  
is either not a valid adapter number or the adapter is  
not functioning. (See NET LOGIN command.)

**Remedy:** Make sure the adapter you are attempting to log in  
through exists and is operational.

\*\*\*\*\*

\*\*\* (Page 13-5)

\*\*\* Place the error message "The network adapter has  
\*\*\* malfunctioned" in proper alphabetic sequence (after "Network  
\*\*\* request is not supported")

\*\*\*\*\*

\*\*\* (Appendix I)

\*\*\* In the eighth line of the section entitled "SAMPLE AUTOEXEC.BAT FOR A  
\*\*\* WORKSTATION THAT BOOTS FROM A FLOPPY DISK," replace **Login Loop**  
\*\*\* with **Login\_Loop**. Make the same replacement in the eleventh line.

## DOCUMENTATION FOR LANPUP

The following documentation assumes that you are already familiar with the NET program and the functions that it supports, as well with the use of LANtastic. If you are not familiar with NET or LANtastic, please familiarize yourself with them before you use LANPUP.

LANPUP, which is included with LANtastic NOS, is a pop-up version of the NET program. LANPUP can pop-up over most word processors, spreadsheets and other software to give you access to network functions from within those programs. LANtastic requires very little memory, so a major factor in the design of LANPUP was also the memory requirement. As of this writing, LANPUP requires less than 5K of RAM! The pop-up utilities of other networks (if they have one) require 25K to 50K of RAM.

### LANPUP Features:

- o Login and Logout of Servers
- o Redirection of Disks
- o Redirection of Printers
- o Printer Queue Management
- o Sending and Receiving of Electronic Mail

All of this in a 5K Pop-up package!

### LANPUP INSTALLATION AND USE

Take the distribution disk and copy LANPUP.EXE to your LANTASTIC subdirectory with the following command:

```
COPY A:LANPUP.EXE C:\LANTASTI
```

To run LANPUP you simply type

```
C>LANPUP
LANtastic (tm) LANPUP V1.1 - Copyright (C) 1988 by ARTISOFT, Inc.
Tucson, AZ
```

--- LANPUP installed, Press Ctrl+Alt+L to activate ---

Once LANPUP is installed, you can pop it up by pressing the Control key, the Alt key, and then the "L" key (keeping all three keys depressed).

If you wish to use LANPUP only as needed and not take up any RAM, you type

```
C>LANPUP/S
```

/S indicates stand alone mode. When in stand alone mode, LANPUP will only be in RAM as you use the program. When you exit, it will be gone and you will have to type LANPUP/S again to use it later.

LANPUP's main screen looks like the following:

```
[Servers]-- Disks--Printers--Queues--Mail
```

The "Servers" selection is highlighted to signify that it will be used when the user presses Enter. To go back and forth between selections, you can press the space bar and/or the left and right arrow keys. To make a selection, press Enter or press the letter that matches the upper case letter in the selections. For example, if you wanted "Disks", you could use the space bar to move to the Disks selection and press Enter, or you could simply press the letter D.

-- SERVERS --

This selection allows you to log into and log out of servers. If you are currently logged into a server, then you will see one of the logged in servers in this window. If you are logged into multiple servers, you may press the up and down arrow keys to position yourself to another server. If you have not logged into any servers, then this window will be blank.

To log in to a server, press the Ins key. You will be asked for the server, your username and password.

```
[Servers]-- Disks--Printers--Queues--Mail  
Server: NEW-AT
```

```
[Servers]-- Disks--Printers--Queues--Mail  
Username: $JACK
```

```
[Servers]-- Disks--Printers--Queues--Mail  
Password:*****
```

Once the password has been entered, the user is logged in. If the login is successful, the servername will appear in the servers list. If you are logged into multiple servers, you may press the up and down arrow keys to position yourself to another server.

```
[Servers]-- Disks--Printers--Queues--Mail  
\\NEW-AT
```

To log out of a server, use the up and down arrow keys to position yourself so that the server is visible in the servers window and press the Del key to "delete" the connection.

To exit the servers selection, or any selection for that matter, press the Escape key.

-- DISKS --

Choosing the Disks selection gives you the ability to attach network disks to disks your computer will use. When Disks is chosen, the list of available disks on your system is displayed.

```
Servers---[Disks]-Printers--Queues--Mail _____  
A: --> (Physical)
```

You can move up and down with the arrow keys to select a disk. You may also press the letter of the disk you wish to view. Pressing F gets us to the F: disk

```
Servers---[Disks]-Printers--Queues--Mail _____  
F: -->
```

Notice that there is currently no connection to disk F:. To make a connection, press Ins and a logged in server will appear. This logged in server will be blinking to signify that this is a "choice in progress" and has not been actually chosen yet.

```
Servers---[Disks]-Printers--Queues--Mail _____  
F: --> \\NEW-AT
```

You can now use the up and down arrow keys to select the correct server to which you want this disk connected. Pressing Enter selects that server and then provides the selection of the network subdirectories. At any time while selecting servers or network subdirectories, you may cancel the process by pressing Escape.

```
Servers---[Disks]-Printers--Queues--Mail _____  
F: --> \\NEW-AT\ Servers' network directory
```

Pressing the down arrow key gets us to the next network subdirectory.

```
Servers---[Disks]-Printers--Queues--Mail _____  
F: --> \\NEW-AT\ROOT The whole disk
```

Note that the description of the network subdirectory that was entered by the system manager is displayed so that you can know more about it. Once the correct network subdirectory is blinking, press Enter to make the actual connection to your disk.

```
Servers---[Disks]-Printers--Queues--Mail _____  
F: --> \\NEW-AT\ROOT
```

To cancel the redirection of a disk, press Del when you are positioned over the disk name.

Servers---[Disks]-Printers--Queues--Mail

F: -->

-- PRINTERS --

Printers are connected and disconnected in the same manner as disks. You press Ins to select a server and a printer device.

-Servers--- Disks-[Printers]-Queues--Mail

LPT1 --> \\NEW-AT@PRINTER Line Printer

-- QUEUES --

LANPUP allows you to look at and manipulate the queue. When "Queues" is selected, you can use the up and down arrow keys to select which server's queue you wish to see.

-Servers--- Disks--Printers-[Queues]-Mail

Server: NEW-AT

You may also press Ins and login to a server at this time if the server is not displayed. You may also press Del to log out of a server.

After the server is selected, the current printer queue entries are displayed.

-Servers--- Disks--Printers-[Queues]-Mail

3(H) @PRINTER \$JACK \\WORKST1 Acctg. Report 08/23/88 07:49:36

-[Hold]-reLase--Delete--Read--hAlt--Stop--Pause--sIngle--rEstart--rUsh

The meaning of the first element is shown below:

- (H) The queue entry is held
- (R) The queue entry has been rushed
- (U) The queue entry is being updated
- (W) The entry is waiting in line to be despoiled
- (\*) The queue entry is being despoiled (printed)
- (D) The queue entry is in the process of being deleted
- (?) A file error has taken place in this queue entry

This entry is currently Held "(H)". It is being sent to the printer named @PRINTER from Username \$JACK who was logged from \\WORKST1 at the time. The comment "Acctg. Report" was placed on this file. The file was sent to the queue at 7:49 am on 8/23.

The commands that you may perform are listed at the bottom of the box. They are as follows:

- |         |   |
|---------|---|
| Hold    | - Do not despool this entry until released              |
| Release | - Allow despooling to take place on a held entry        |
| Delete  | - Delete the queue entry                                |
| Read    | - Look at the file that is being queued (See Mail Read) |

Privileged Choices:

- Halt - Stop all despooling now
- Stop - Send despooling at end of current job
- Pause - Temporarily pause despooling
- Single - Despool only one job and then stop
- Start - Despool all ready jobs
- Restart - Combination of Halt and Start to reprint current job
- Rush - Make the current queue entry top priority.

-- MAIL --

Pop-up mail is one of the most useful aspects of the LANPUP software. You can send messages or files to persons across the network while in an application. You can even send notes to yourself if you have an idea or phone message that you want to remember.

When Mail is selected, a list of servers will be displayed. Mail is sent through a server. You select the server by using the up and down arrow keys. You may press Ins to log in to a server or Del to log out.

```
-Servers-- Disks--Printers--Queues-[Mail]
Server: NEW-AT
```

Once the server is selected, the list of mail that you have sent to others and others have sent to you is displayed.

```
-Servers-- Disks--Printers--Queues-[Mail]
BILLY $JACK \386-SYSTEM Monthly Sales Rep. 08/08/88 18:37:48
--[Read]--Delete---Send---
```

In the above example, the recipient is BILLY. The message was sent from \$JACK on \386-SYSTEM with the comment "Monthly Sales Rep." This was mailed on 8/8 at 6:37 pm. You can choose to Read the mail, Delete the mail or Send new mail to someone.

If you choose to read the mail, the mail entry is placed above to remind you of what you are reading. You are then asked for the filename which is to receive the mail. You may type any valid DOS path including disk letters. Using this feature, you can send and receive binary files such as programs or databases or you can simply use it to save letters onto a disk.

```
Billy $JACK \386-SYSTEM Monthly Sales Rep. 08/08/88 10:37:48
FILENAME:\LOTUS\SPREAD\123.WK1
```

You can also choose to read the mail to the file CON, which refers to the console. If you choose to do this, your mail will be displayed line by line on the screen. You may use the down arrow key or Enter to advance the mail forward.

It was decided to conserve RAM by not allowing you to

go backwards through a file while reading mail.

```
Billy $JACK \386-SYSTEM Monthly Sales Rep. 08/08/08 10:37:48  
Sales Report for July:
```

Once you hit the end of the file you will see the symbol <<END>>.

```
Billy $JACK \386-SYSTEM Monthly Sales Rep. 08/08/08 10:37:48  
<<END>>
```

To send mail to someone, you choose the Send function.

```
Servers-- Disks--Printers--Queues-- [Mail]  
To: Kelly  
Read--Delete-[Send]
```

You are asked to whom you would like to send the mail and for a comment for the mail.

```
Servers-- Disks--Printers--Queues-- [Mail]  
Re: Annual Report  
Read--Delete-[Send]
```

Your are then asked for the filename that contains the content of the mail. You may type any DOS path or CON to input the mail from the console.

```
Servers-- Disks--Printers--Queues-- [Mail]  
Filename: CON  
Read--Delete-[Send]
```

When entering data from the console, you may use the left and right arrow keys to move around in the line of text. You may also use the Ins key to insert text in front of other text. Pressing the Ins key again takes you out of insert mode.

## NETBIOS SETUP PROGRAM DOCUMENTATION

The NBSETUP program is used to setup (alter) NETBIOS session and NCB parameters so that more users can log into a server. If you have an ARTISOFT NETBIOS, you will be able to perform this function when you install the NETBIOS software (LANBIOS or AILANBIOS).

Primarily, you will use NBSETUP if your NETBIOS has no facility for altering the maximum number of configured sessions and NCB's, although it may be run with any NETBIOS. This document does not attempt to describe the significance of NCB's and sessions in their relation to the LANtastic network. You should consult the LANtastic Network Operating System User's Manual for an explanation of these.

Although there is no NETBIOS standard, most NETBIOS manufacturers conform to either the IBM PC Network Adapter NETBIOS or the IBM Token Ring NETBIOS. When either of these NETBIOS's is run, the maximum number of configured sessions is set to 6 and the maximum number of configured NCB's is set to 12. This default translates to 6 concurrent logins on a LANtastic server.

You can run NBSETUP to change these default values. NBSETUP must, however, be run before any network software is started. The reason for this is that NBSETUP performs a NETBIOS reset to alter the default parameters and such a reset would cause the network software to stop working (actually, NBSETUP will not run if either REDIR or SERVER were started).

The syntax for NBSETUP is

```
NBSETUP [parameters]
```

where parameters are optional command line parameters which specify values that sessions and NCB's should be set to. Parameters may be separated by either spaces or slashes (/). Parameters which take on values may be followed by either = or :.

The command line parameters are as follows:

OPTION: VERBOSE

VERBOSE displays detailed information about what values the NBSETUP parameters are set to. Examples of this would include the command line used to invoke NBSETUP and the maximum number of NCB's and sessions the adapter has been set to.

You can use VERBOSE to verify that the number of NCB's and sessions was set to the values that you wanted.

EXAMPLE:

```
NBSETUP VERBOSE MAX
```

OPTION: MAX

MAX will set the number of NCB's and sessions to the maximum the NETBIOS will support. Many NETBIOS implementations support only 32 maximum sessions and 32 maximum NCB's (all ARTISOFT NETBIOS's support at least 128 sessions and NCB's). You can use MAX along with the VERBOSE option to determine the maximum number of NCB's and sessions your NETBIOS interface supports.

You may mix the MAX option with other options such as NCBS= or SESSIONS=.

EXAMPLES:

```
NBSETUP VERBOSE MAX
NBSETUP MAX NCBS=45
```

OPTION: NCBS=

NCBS= will set the maximum number of NCB's that the NETBIOS will recognize. The value you specify for NCB's must be in a range that your NETBIOS supports. Most NETBIOS's will reset to both their default NCB and session values when either value is not in range, or either value is 0.

EXAMPLE:

```
NBSETUP NCBS=34
NBSETUP NCBS=0
```

OPTION: SESSIONS=

SESSIONS= will set the maximum number of sessions that the NETBIOS will recognize. The value you specify for sessions must be in a range that your NETBIOS supports. Most NETBIOS's will reset to both their default NCB and session values when either value is not in range, or either value is 0.

EXAMPLES:

```
NBSETUP SESSIONS=100
NBSETUP/NCBS:32/SESSIONS:32
NBSETUP SESSIONS=0
```

OPTION: CHECK

CHECK will not alter any NETBIOS parameters but will display the same items as the VERBOSE command. You can use CHECK to see what the current NETBIOS parameters are set to.

EXAMPLE:

```
NBSETUP CHECK
```

OPTION: HELP or ?

HELP or ? will display a short description of all the command line parameters.

## EXAMPLE:

NBSETUP ?

You may mix several parameters on the command line. The order of the parameters is not important. NBSETUP performs the following actions sequentially before resetting the NETBIOS:

1. The number of NCB's and sessions are set to the values that the adapter currently has.
2. If the MAX parameter was specified, then the number of NCBs and sessions is set to the maximum that the NETBIOS can support.
3. If NCBS= or SESSIONS= parameters were specified, then the NCB's or sessions are set to the corresponding values.

The above sequence, for example, implies that you can mix MAX with NCBS=10 and, if the maximum number of sessions were 128, then that would be equivalent to specifying NCBS=10 SESSIONS=128. The above sequence also implies that if no options are present then the NETBIOS is reset with the same parameters that it already had. Here are some examples of various command lines:

```
NBSETUP
NBSETUP SESSIONS=40 NCBS=40
NBSETUP SESSIONS=40 NCBS=40 VERBOSE
NBSETUP MAX VERBOSE SESSIONS=10
NBSETUP VERBOSE
```

You can also redirect NBSETUP's output to a file or device. This may be useful if you want to log verbose information. For example,

```
NBSETUP MAX VERBOSE >NBSETUP.LOG
```

## NBSETUP Messages

=====

NBSETUP will display two types of messages: informative and error. Informative messages require no direct action. Error messages imply that NBSETUP was not successful. If you run NBSETUP in a batch file, you can test for errors using the IF ERRORLEVEL command. The following error levels may be returned:

- 1 No NETBIOS present
- 2 NETBIOS is already in use

## Informative Messages

-----

```
MESSAGE: LANtastic (tm) NBsetup V1.0 - (C) Copyright 1988
ARTISOFT Inc.
```

**Meaning:** This message is displayed whenever NBSETUP is invoked.  
The version number may vary from the above version number.

**MESSAGE:** ---- NETBIOS parameters have been altered ----

**Meaning:** This message is displayed after the NETBIOS parameters have been successfully altered.

**MESSAGE:** ---- NETBIOS parameters have NOT been altered ----

**Meaning:** This message is displayed if the NETBIOS parameters have not been altered. The message may appear after an error or when the CHECK parameter is used.

**MESSAGE: Command line:**

ccc cccc ccccc

**NETBIOS parameters:**

Configured maximum sessions sss

Configured maximum NCBs nnn

**Meaning:** This message is displayed when you specify the VERBOSE command line option. The "ccc cccc ccccc" denotes the command line you invoked NBSETUP with. The number sss is the number of sessions that the NETBIOS currently supports. The number nnn is the number of NCB's the NETBIOS currently supports.

<b>MESSAGE:</b>	Valid parameters are
VERBOSE	Displays NETBIOS information after setting it
MAX	Sets maximum NCBs and sessions that NETBIOS supports
NCBS=n	Sets maximum NCBs to n
SESSIONS=n	Sets maximum sessions to n
CHECK	Displays current NETBIOS information but does not set it
? or HELP	Displays this help text

**Meaning:** This message is displayed when you specify the HELP or ? command line option.

#### Error Messages

---

**ERROR:** NETBIOS interface is not installed

**Meaning:** You do not have a NETBIOS interface installed.

**Remedy:** You must first install your NETBIOS software. If you are using an Artisoft NETBIOS, then you must run NBSETUP after running LANBIOS or AILANBIOS.

**ERROR:** NETBIOS interface is in use - cannot be set up now

**Meaning:** You have already started software which is currently using the NETBIOS interface. NBSETUP will not change NETBIOS parameters while other software is using the NETBIOS.

**Remedy:** You should run NBSETUP right after you bring up the NETBIOS interface. In particular, you should run NBSETUP before REDIR or SERVER.