

**NetWare<sup>®</sup> for  
AViiON<sup>®</sup> Series Systems:  
Workstation Installation**



# NetWare<sup>®</sup> for AViiON<sup>®</sup> Series Systems: Workstation Installation

069-000619-00

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# Preface

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This manual will show you how to install the NetWare® for AViiON® Systems product on a workstation. Workstation software includes either the SHGEN or the WSGEN program. Follow the appropriate procedures in Chapter 1 for the software you received.

We assume that you are familiar with both the UNIX® and MS-DOS® operating systems and that you have your AViiON and PC workstations installed and running correctly.

If you are unfamiliar with networks, you may want to read "Introduction to NetWare" in *NetWare® for AViiON® Series Systems User Book* before reading this manual.

## Organization of this manual

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### **Chapter 1 Installing Network Software**

This chapter explains how to use either the SHGEN.EXE or WSGEN.EXE program to install the shell software on workstations.

### **Chapter 2 Configuring the Workstation Shell**

This chapter provides an alphabetical list of the shell configuration options.

## Related Documents

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You received a comprehensive set of documents with your NetWare for AViiON Systems release package. The manuals listed below are included in that set and contain information that augments the text of this manual.

*NetWare® for AViiON® Series Systems: Installation*  
(069-000488)

This manual provides detailed instructions for planning a NetWare network, installing NetWare for AViiON Systems on an AViiON computer, and setting up user accounts. It is written for the network supervisor.

*NetWare® for AViiON® Series Systems: Concepts*  
(069-000483)

This manual provides an alphabetically arranged glossary of NetWare terminology. It is written for all levels of NetWare users, but it will be particularly useful to supervisors who are performing their first installation of the NetWare for AViiON Systems product.

*NetWare® for AViiON® Series Systems: User Book*  
(069-000486)

This manual provides a general overview of NetWare. It is written for first-time users who are unfamiliar with networks.

## Reader, please note

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In all examples within the text, we use

This typeface to show your entry.

This typeface to show system prompts and responses.



## Using command line utilities

Command line utilities perform NetWare tasks directly from the client workstation command-line prompt.

The command format displays the appropriate syntax for command lines. The command format is

**COMMAND** *argument* [*option...*]

where

**COMMAND** must be spelled exactly as shown. We show commands in capital letters, but you can type them in either upper- or lowercase characters.

*argument* should be replaced with the information pertinent to your task. Arguments for each command, many of which include variables, are listed with the command. They can often be abbreviated.

[ ] indicate that the enclosed item is optional: you can enter a command with or without the enclosed item. In this case, *option* may be omitted. Options for each command are listed with the command. Do not type the brackets.

... indicates that more than one NetWare option can be entered in the command.

Always press <Enter> to execute a command after you have typed it at the command-line prompt.

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End of Preface

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# Chapter 1

## Installing Network Software

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To convert a personal computer running DOS to a network workstation, you add a network board, cabling, and network software. The *NetWare® Installation Supplement* for your network board gives the board installation procedures and the cabling instructions. In this chapter, we provide information on using either the SHGEN.EXE or WSGEN.EXE program to install the network software for a personal computer running DOS. We explain how to install the software on a workstation boot diskette, on a workstation hard disk, or at the file server.

The network software includes the NetWare® shell program, the IPX program, and the LAN driver. The NetWare shell program, NETx.COM, creates a shell that intercepts application program requests and redirects those that are network requests to the network. The *x* in NETx.COM refers to the DOS version used on your workstation. The IPX datagram delivery service, IPX.COM, manages communications among the network stations. The LAN driver, or network board driver, which is specific for each type of network board, allows the network board to communicate with the network.

The client software you received includes either the SHGEN.EXE program or the WSGEN.EXE program. Either program generates the shell files, and links (adapts) IPX protocol to a board-specific LAN driver and a unique network board configuration option.

After running either SHGEN or WSGEN, you will then copy IPX.COM and NETx.COM to a workstation boot diskette. Each time you boot from this diskette, the workstation will load the shell files into its memory. Configuration parameters stored in the NET.CFG file, described in Chapter 2, specify how the IPX protocol and the LAN driver files are linked.

This chapter covers the following topics.

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## **Preparing the workstation computers**

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1. Verify that your workstation meets the hardware and memory requirements.

You can use any of the following computers as network workstations:

- IBM PC or compatible
- IBM PC XT™ or compatible
- IBM PC AT® or compatible
- IBM PS/2® (any model)

NetWare workstations have the following memory requirements.

- At least 384 Kbytes of memory to load the NetWare shell files.
- 512 Kbytes of memory to run most application programs and NetWare menu utilities.

If your workstations need more memory, you can install add-on memory boards available from your computer dealer. Consult the manuals from your computer's manufacturer for instructions on installing memory boards.

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**Note:** Steps 2 and 3 do not apply to diskless workstations, because they cannot boot without the file server.

---

2. Prepare to install NetWare by setting up your workstations and booting them with DOS.

This ensures that the workstations are functional. Do not install your networking hardware yet.

3. Follow the initial setup instructions that came with each computer. When each workstation has successfully booted, shut it off and continue with installation.

## **Installing the network board**

In each workstation, you will install a network board that conforms to your network topology.

1. Locate your network board installation instructions in the package of manuals accompanying the NetWare product. Each type of network board requires an installation supplement with instructions for installing and setting up the board.
2. Install the Remote Reset PROM (optional).

Remote Reset allows a workstation to boot up without using its local drive(s). Refer to the Installation Supplement for instructions on installing the PROM, which may also require setting a switch or a jumper.

3. Install the network board.

The Installation Supplement helps you select, set, and record network board configurations. Install the board with the workstation's power turned off.



**Note:**

---

You must select certain interrupt, I/O, or memory options before installing your network board. Choose options that are unique among the boards in the workstation, including other network boards, graphics adapters, and modem adapters. Choose the default setting if available.

Choosing the same configuration and the same type of network board for all your workstations simplifies the boot file creation process.

---

**4. Record network board configuration settings.**

You will need information about these settings later when you run the SHGEN.EXE or WSGEN.EXE program.

If your client software includes the SHGEN.EXE program, continue with the next section, "SHGEN procedures." If your client software includes the WSGEN.EXE program, skip to the section, "WSGEN procedures," starting on page 1-11.

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**SHGEN procedures**

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**Making working copies of the SHGEN-1 diskette**

You will be running the SHGEN.EXE program from the SHGEN-1 diskette. Create a working copy of the SHGEN-1 diskette and set aside the original as a backup. The SHGEN.EXE program creates or modifies various files on the diskette. Using the working copy ensures that you have a backup in case any diskette errors occur.

---

**Note:** Make sure the computer copying or running the SHGEN.EXE program uses diskettes with more than 200 Kbytes of free space.

---

You can run the SHGEN.EXE program from a diskette, but running it from a hard disk or a network drive is simpler.

---

**Note:** If you have only diskless workstations, there is no way to read the SHGEN-1 diskette or to create the remote boot image files. The remote boot image files must be already installed on the host in the NetWare file structure. In this case, you can skip the following copy procedure and proceed to the section, "Configuring the software with the SHGEN program," page 1-7.

---

## Copying SHGEN-1 files onto a diskette

1. Copy the files from the SHGEN-1 diskette onto a blank diskette with the DOS DISKCOPY command or other command that copies a diskette by bits.

---

**Note:** Do not use the DOS COPY command. COPY does not reproduce volumes or directories, and it will not format the working diskette correctly.

---

2. Label the copy either SHGEN-1 work diskette. Skip to the section, "Configuring the software with the SHGEN program," page 1-7

## Copying SHGEN files onto a hard disk or a network drive

If you are planning to run the SHGEN.EXE program from a hard disk or a network drive, you must create

two new directories for these files and then transfer the appropriate files into each directory.

If you have a diskette named LAN\_DRV\_???, you will load the information from that diskette when you run the SHGEN program.

1. Select an area in your directory structure where you want to make directories for your SHGEN-1 diskette working copy.

2. Make a directory and name it **NETWARE**.

Use the DOS MD command to make new directories.

3. Make a subdirectory in the **NETWARE** directory and name it **SHGEN-1**.
4. Copy the **SHGEN.EXE** file from the **SHGEN-1** diskette to the **NETWARE** directory.
5. Copy all other files from the **SHGEN-1** diskette to the **SHGEN-1** directory.

## **Configuring the software with the SHGEN program**

The **SHGEN.EXE** program generates two files, **IPX.COM** and **NETx.COM**, which you will copy onto the workstation boot diskette. When you run the **SHGEN** program, you select a LAN driver matching the workstation's network board. Then you select a configuration option matching the option you set on that network board. The **SHGEN.EXE** program creates the shell files with those options.

1. Boot a personal computer with DOS 3.0 or higher to run the **SHGEN** program.

If you are running the **SHGEN** program from a network workstation, log in to a file server. The computer requirements for running the **SHGEN**



### 3. Select a LAN driver.

Choose the option **Select LAN Driver From List**.

An **Available LAN Drivers** list appears.

Select a **LAN driver** that matches your network board.

The LAN driver you selected appears in the **Selected LAN Driver** window.

---

**Note:** If no LAN drivers in the list match your network board, you will need to load LAN drivers from diskette. Insert the LAN\_DRV\_??? diskette into the diskette drive. Choose the option **Load into List**. Select a LAN driver that matches your network board.

If a driver on your LAN\_DRV\_??? diskette is the same as that of a driver already listed in SHGEN, you may be asked to confirm the replacement. The six-digit code found in parentheses at the end of the driver title represents the year, month, and day the driver was updated.

---

Press <Escape> to save your selection and continue.

### 4. Select a LAN driver configuration option.

You must choose the same option for the shell files that you set on the network board. See your network board **Installation Supplement** for more information.

Workstations using **Remote Reset** must use the default configuration option or an option specified in the **Installation Supplement**. Choose the default setting if available.

Workstations using **IBM Token-Ring adapters** must use an option for primary adapters, not for alternate adapters.

---

**Note:** For IBM PS/2s: After selecting a configuration, configure the network board using the software contained in the IBM REFERENCE diskette.

---

Choose the same option for all workstations with similar machine types. This allows you to copy the same boot files to each boot diskette.

If your computer displays the message, "Self Configured," the shell has automatically adjusted for your board.

**5. Confirm and record your selections.**

After selecting the configuration option, your selections appear on the screen.

If the selections are correct, record the selected LAN driver and configuration option as they appear on the screen. This helps you keep track of the shell files you are placing on the workstation boot diskettes.

Select **Yes** to continue shell generation and skip to the section "Creating the master shell diskette," page 1-16.

If any selections are incorrect, select **No** to return to the first menu and select a new driver and options.

## WSGEN procedures

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### Making working copies of the DOS WORKSTATION SERVICES diskette

You will be running the WSGEN.EXE program from the DOS WORKSTATION SERVICES diskette. Create a working copy of the DOS WORKSTATION SERVICES diskette and set aside the original as a backup. The WSGEN.EXE program creates or modifies various files on the diskette. Using the working copy ensures that you have a backup in case any diskette errors occur.

---

**Note:** Make sure the computer copying or running the WSGEN.EXE program uses diskettes with more than 200 Kbytes of free space.

---

You can run the WSGEN.EXE program from a diskette, but running it from a hard disk or a network drive is simpler.

---

**Note:** If you have only diskless workstations, there is no way to read the DOS WORKSTATION SERVICES diskette or to create the remote boot image files. The remote boot image files must be already installed on the host in the NetWare file structure. In this case, you can skip the following copy procedure and proceed to the section, "Configuring the software with the WSGEN program," page 1-13.

---

### Copying DOS WORKSTATION SERVICES files onto a diskette

1. Copy the files from the DOS WORKSTATION SERVICES diskette onto a blank diskette with the DOS DISKCOPY command or other command that copies a diskette by bits.

---

**Note:** Do not use the DOS COPY command. COPY does not reproduce volumes or directories, and it will not format the working diskette correctly.

---

2. Label the copy DOS WORKSTATION SERVICES work diskette.

Skip to the section, "Configuring the software with the WSGEN program," page 1-13

## **Copying DOS WORKSTATION SERVICES files onto a hard disk or a network drive**

If you are planning to run the WSGEN program from a hard disk or a network drive, you must create two new directories for these files and then transfer the appropriate files into each directory.

If you have a diskette named LAN\_DRV\_???, you will load the information from that diskette when you run the WSGEN program.

1. Select an area in your directory structure where you want to make directories for your DOS WORKSTATION SERVICES diskette working copy.
2. Make a directory and name it NETWARE.

Use the DOS MD command to make new directories.

3. Make a subdirectory in the NETWARE directory and name it WSGEN.
4. Copy the WSGEN.EXE file from the DOS WORKSTATION SERVICES diskette to the NETWARE directory.



5. Copy all the files from the DOS WORKSTATION SERVICES diskette to the WSGEN directory.

## **Configuring the software with the WSGEN program**

The WSGEN.EXE program generates the IPX.COM files, which you will copy onto the workstation boot diskette. When you run the WSGEN program, you select a LAN driver matching the workstation's network board. Then you select a configuration option matching the option you set on that network board. The WSGEN.EXE program creates the workstation files with those options.

1. Boot a personal computer with DOS 3.0 or higher to run the WSGEN program.

If you are running the WSGEN program from a network workstation, log in to a file server. The computer requirements for running the WSGEN program are different, depending on the method you choose.

To run the WSGEN program from diskettes, your computer requires

- 640 Kbytes of memory
- DOS 3.0 or above
- A high-capacity diskette drive compatible with the NetWare installation diskettes

To run the WSGEN program from a local hard disk or a network drive, your computer requires

- 640 Kbytes of memory
- 1.5 Mbytes of free disk space
- DOS 3.0 or above

2. Run the WSGEN program.

For diskettes, insert the DOS WORKSTATION diskette in drive A. For hard drives, enter the NETWARE directory. Type

WSGEN

A welcome screen appears, explaining the program options. Press <Enter> to continue.

3. Select a LAN driver.

An Available LAN Drivers list appears.

Select a LAN driver that matches your network board.

---

**Note:**

If no LAN drivers in the list match your network board, you will need to load LAN drivers from diskette. Insert the LAN\_DRV\_??? diskette into the diskette drive. Choose the option Load into List. Select a LAN driver that matches your network board.

If a driver on your LAN\_DRV\_??? diskette is the same as that of a driver already listed in SHGEN, you may be asked to confirm the replacement. The six-digit code found in parentheses at the end of the driver title represents the year, month, and day the driver was updated.

---

Press <Enter> to save your selection and continue.

4. Select a LAN driver configuration option.

From the list that appears, select the configuration option that matches the setting on your network board.

You must choose the same option for the workstation files that you set on the network board. See your network board Installation Supplement for more information.

Workstations using Remote Reset must use the default configuration option or an option specified in the Installation Supplement. Choose the default setting if available.

Choose the same option for all workstations with similar machine types. This allows you to copy the same boot files to each boot diskette.

If your computer displays the message, "Self Configured," the shell has automatically adjusted for your board.

**5. Confirm and record your selections.**

After selecting the configuration option, your selections appear on the screen.

If the selections are correct, record the selected LAN driver and configuration option as they appear on the screen. This helps you keep track of the shell files you are placing on the workstation boot diskettes.

Select Yes to continue shell generation.

If any selections are incorrect, select NO to return to the first menu and select a new driver and options.

## **Creating the master shell diskette**

---

The master shell diskette is a working copy of the shell files which you will copy to individual workstation boot diskettes.

1. Format the master shell diskette.
2. Copy IPX.COM and NETx.COM to the master shell diskette.

The IPX.COM and NETx.COM files are located in the SHGEN-1 or WSGEN subdirectory (if you use a hard disk) or on the SHGEN-1 or DOS WORKSTATION SERVICES diskette.

3. Label the master shell diskette with a name such as MSD #1. List the LAN driver, configuration option, and additional boot files on the diskette so you will know exactly which workstations can use a copy for a boot diskette.
4. If you are using Ethernet\_II frame types, you must run ECONFIG. The command line will have the following format

**ECONFIG IPX.COM SHELL: *frametype***

where *frametype* is the workstation's E\_II frame type. The allowable options are E:8137 (Novell) or E:600 (XNS).

---

**Note:** NetWare for AViiON Systems supports Novell IEEE 802.3 compatible frames and Ethernet\_II frames. Existing NetWare servers and clients do not need to be changed. The AViiON server will route between both frame types. For maximum efficiency and optimum routing times, however, you should set all servers to the same frame format.

Refer to the NetWare/286 and NetWare/386 manuals for instructions on using ECONFIG on NetWare/286 servers and setting frame types on NetWare/386 servers.

---

5. Repeat steps 1 through 4 for each type of workstation.

Create a master shell diskette for every workstation with the same network board, machine type, and configuration options.

Keep these diskettes in a safe place, and use them when you copy the shell files to each workstation boot diskette.

## **Creating a workstation boot diskette**

---

Workstations that will not be using Remote Reset need a boot diskette to log in to the file server. This boot diskette contains the NetWare shell files and additional boot files. To create a workstation boot diskette, complete the following steps.

1. Copy the shell files from the master shell diskette.

Copy the IPX.COM and NETx.COM onto the workstation's boot diskette.

If you are generating a shell for one workstation, you can use the master shell diskette as the

workstation's boot diskette or make a copy of it and keep the original as a backup.

If your workstation needs special configuration options, create a SHELL.CFG file. This is a DOS text file that resides on the boot diskette. For more information, see Chapter 2.

2. Copy additional boot files to the workstation boot diskette.

You might want to add the following files:

AUTOEXEC.BAT  
CONFIG.SYS  
SHELL.CFG (see Chapter 2)

Other boot files for customizing the workstation boot procedure and operating system are explained in the section "Boot files" in *NetWare® for AViiON® Series Systems: Concepts*.

3. Label the workstation boot diskette.

Label the boot diskette with the workstation name, the LAN driver, the configuration option, and the custom boot files. This information allows you to easily return a misplaced boot diskette to its proper place.

4. Record the boot file information on the workstation worksheet.

This information might be helpful if troubleshooting becomes necessary.

5. Repeat steps 1 through 4 for each workstation.

## **Booting the workstation and logging in to a file server**

### **1. Boot the workstation.**

You can boot a workstation in any of the following ways

- **From a workstation boot diskette in drive A**

Insert the workstation boot diskette into drive A and turn on the computer. If the computer is already running, perform a warm boot by pressing <Ctrl><Alt><Delete>.

- **From boot files stored on the workstation's hard drive**

- **From a Remote Reset file on the file server.**

If you want to add Remote Reset, skip to "Running DOSGEN to add Remote Reset."

### **2. Log in to a file server.**

Use the following format.

**LOGIN *servername*/SUPERVISOR**

where *servername* is the name of your file server.

You have completed the workstation installation.

## **Running DOSGEN to add Remote Reset (optional)**

This section explains how to use the DOSGEN utility to create remote boot image files on the file server's hard disk. These files let a workstation user boot NetWare from the file server rather than a local drive.

Workstations booting through a remote boot image file need a Remote Reset PROM inserted (and possibly a switch or a jumper block adjusted) on the workstation's network board. The Installation Supplement for your board describes this procedure.

Once the network board is ready for Remote Reset, you can run DOSGEN to upload the workstation's boot files to the host file server.

If you connect to multiple networks, you should run the DOSGEN utility on each file server that may come up as a workstation's default server. Then the next available file server will function as the default server if the normal default server is busy.

Many different workstations can use the same Remote Reset boot image file if they have the same NetWare boot file requirements. However, you must create a separate boot image file on the file server for each version of DOS that runs on your network workstations.

If all the workstations on your network use the same version of DOS and have identical NetWare boot commands, you can follow the instructions under "Creating a single remote boot image file," page 1-21.

If the workstations use different versions of DOS or different NetWare boot commands, then you should skip to "Creating multiple remote boot image files," page 1-22.



## Creating a single remote boot image file

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**Note:** In this procedure, the DOSGEN utility creates a default remote boot image file, NET\$DOS.SYS.

If you already have that file, you cannot use this procedure. Instead, refer to "Creating multiple remote boot image files," page 1-22.

---

To create a single boot image file, follow these steps.

1. Boot a workstation using the workstation's boot diskette, and log in as SUPERVISOR.
2. Log in to the workstation's default file server.
3. Prepare to run DOSGEN.

Map drive F to SYS:SYSTEM and drive G to SYS:LOGIN by typing

```
MAP F:=SYS:SYSTEM<Enter>
MAP G:=SYS:LOGIN<Enter>
```

Change to the SYS:LOGIN directory by typing

```
G:<Enter>
```

4. Run DOSGEN.

Verify that the boot diskette is in drive A.

At the DOS prompt, type

```
F:DOSGEN<Enter>
```

DOSGEN creates a default boot image file called NET\$DOS.SYS that contains the same files as the boot diskette in drive A. DOSGEN then copies NET\$DOS.SYS into the SYS:LOGIN directory.

5. Copy the AUTOEXEC.BAT file from the boot diskette in drive A to the SYS:LOGIN directory and also to the default directory specified in the login script. From the SYS:LOGIN directory, type

```
COPY A:AUTOEXEC.BAT<ENTER>
COPY A:AUTOEXEC.BAT PATHNAME <ENTER>
```

where *PATHNAME* describes the complete path to the default directory. If SYS:LOGIN is the default directory, you do not need to type the second COPY statement.

A workstation with Remote Reset enabled can now boot from the file server as well as from a local boot diskette.

## Creating multiple remote boot image files

When you create multiple remote boot images, each workstation will have its .SYS and .BAT files in the SYS:LOGIN directory. For this reason, each set of .SYS and .BAT files needs a unique name.

In addition, you must create a BOOTCONF.SYS file in the SYS:LOGIN directory. BOOTCONF.SYS tells the file server which boot image file a workstation needs.

To create multiple boot image files, follow these steps.

1. Collect all the workstation boot diskettes that you want to convert to remote boot image files.
2. Boot a workstation using a DOS diskette.
3. Replace the diskette in drive A with a NetWare boot diskette.
4. Rename the AUTOEXEC.BAT file on the boot diskette.

Give the AUTOEXEC.BAT file on the boot diskette a new name and a .BAT extension. If several workstations will use the same remote boot image file, you can give the AUTOEXEC.BAT files for those workstations the same name.

For example, you could choose a name such as IMAGE2.BAT for the batch file on the boot diskettes for workstations #3 and #4 if they use identical boot commands.

Make a list of your changes. Later in this procedure, you will need information about each new file name and the diskette(s) it resides on.

You will also need to know the network and node addresses for each workstation that will use the diskette, and the default directory that is specified in the login script associated with each diskette.

Making a detailed list as you proceed will simplify your task when you create the BOOTCONF.SYS file.

5. Create a new AUTOEXEC.BAT file on the boot diskette to access the renamed .BAT file.

Create the new AUTOEXEC.BAT file by typing:

```
COPY CON AUTOEXEC.BAT<ENTER>  
NEWNAME.BAT<^Z><ENTER>
```

where *NEWNAME* is the name you used to rename the AUTOEXEC.BAT file.

Repeat steps 3 through 5 for each boot diskette.

Each time a workstation is booted with a modified diskette, the operating system will read the AUTOEXEC.BAT file and then execute the boot commands in the renamed .BAT file.

6. Boot the workstation using a modified boot diskette and log in as SUPERVISOR.
7. Log in to the workstation's default file server.
8. Prepare to run DOSGEN.

Map drive F to SYS:SYSTEM and drive G to SYS:LOGIN by typing

```
MAP F:=SYS:SYSTEM<Enter>  
MAP G:=SYS:LOGIN<Enter>
```

Change to the SYS:LOGIN directory by typing

```
G:<Enter>
```

9. Verify that the boot diskette to be copied is inserted in drive A.
10. Run DOSGEN to create remote boot image files.

To create a unique boot image file, type

```
F:DOSGEN A:<space>NEWNAME.SYS<Enter>
```

where A: is the local drive holding the boot diskette and *NEWNAME.SYS* is the name that DOSGEN will give to the new boot image file in the SYS:LOGIN directory. For *NEWNAME*, type the name you used in step 4 to rename the AUTOEXEC.BAT file on that diskette.

Repeat steps 9 and 10 for each boot diskette that requires a separate boot image file.

11. Change to the SYS:LOGIN directory.
12. Using the COPY utility, create a BOOTCONF.SYS file in the SYS:LOGIN directory.

---

**Note:** If the workstation's file server already has a BOOTCONF.SYS file, you must add the new entries to the existing file. We explain how to do this in "Examples of boot image files," page 1-26.

---

To create the BOOTCONF.SYS file, type

```
COPY CON BOOTCONF.SYS<ENTER>
```

Then type a separate line and press <Enter> for each workstation. Use the following format.

***0x network\_address , node\_address = filename***

*Shown with spaces between fields for readability: don't type them.*

At the end of the last line, type <^Z> and then press <Enter> to save the BOOTCONF.SYS file.

13. Copy the diskette's renamed AUTOEXEC.BAT file to the SYS:LOGIN directory and to the default directory associated with that diskette.

From the SYS:LOGIN directory, type

```
COPY A:NEWNAME.BAT<ENTER>  
COPY A:NEWNAME.BAT PATHNAME <ENTER>
```

where *NEWNAME* is the name that you used to rename the AUTOEXEC.BAT file in step 4, and *PATHNAME* describes the complete path to the default directory. If SYS:LOGIN is the default directory, you do not need to type the second COPY statement.

Repeat step 13 for each boot diskette that requires a unique boot image file.

## Examples of boot image files

Suppose you created a boot image file named `IMAGE1.SYS` for workstation #1. The network address for workstation #1 is 1 and the node address is 11111.

You also create a file for workstations #3 and #4 which you name `IMAGE2.SYS`. Workstation #3 has network and node addresses of 1 and 33333, respectively, and workstation #4 has 1 and 44444.

You would make the `BOOTCONF.SYS` file by typing

```
COPY CON BOOTCONF.SYS<ENTER>
0x1,11111=IMAGE1.SYS<ENTER>
0x1,33333=IMAGE2.SYS<ENTER>
0x1,44444=IMAGE2.SYS<^Z><ENTER>
```

The `BOOTCONF.SYS` file would contain the following three lines

```
0x1,11111=IMAGE1.SYS
0x1,33333=IMAGE2.SYS
0x1,44444=IMAGE2.SYS
```

If your network is expanding, then you may already have a `BOOTCONF.SYS` file in your `SYS:LOGIN` directory. In this case, you must add the new boot image specifications to the existing file.

To add the three lines in the example above to an existing `BOOTCONF.SYS` file, you would type

```
COPY BOOTCONF.SYS + CON<ENTER>
0x1,11111=IMAGE1.SYS
0x1,33333=IMAGE2.SYS
0x1,44444=IMAGE2.SYS<^Z><ENTER>
```

The `COPY` utility will append the new lines to the old `BOOTCONF.SYS` file.

End of Chapter

# Chapter 2

## Configuring the Workstation Shell

---

The workstation shell comprises two executable files, IPX.COM and NETx.COM. The shell handles many network routines and processes.

Some applications involving peer-to-peer communications or distributed processing need special treatment by the shell. Database, multitasking, or NetBIOS applications, for example, may require shell parameter values different from the defaults.

You can modify some of the shell parameters so your applications run as intended on the network. To do so, you create a SHELL.CFG file.

To find out which parameters you need to change, check the setup reference for each application you use on the network. Changing shell parameters might also solve problems with printing, file retrieval, and other processes.

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## Creating a shell configuration file (SHELL.CFG)

---

To create a shell configuration file, follow these steps.

1. Use a DOS text editor to create the SHELL.CFG file.

To adjust the shell's responses to application software requirements, create a SHELL.CFG file with the DOS COPY command or a text editor.

For each change from the default, type the parameter name and the value. If you leave a space before the = sign, you must also leave a space after the = sign.

For example, to set the local printers to zero, type:

```
LOCAL PRINTERS = 0 <Enter>
```

2. Copy the SHELL.CFG file onto the master shell diskette.

If all workstations use the same SHELL.CFG file, you can save time by copying the SHELL.CFG file onto the master shell diskette. If you create different SHELL.CFG files for each workstation, copy each SHELL.CFG file directly onto the workstation boot diskette.



## SHELL.CFG parameter defaults

---

The following chart lists the default parameters that take effect in the absence of a SHELL.CFG file. Following the chart is a brief description of each parameter's function and some possible reasons for changing the default setting.

Parameter	Default
<b>Parameters Used by IPX.COM</b>	
CONFIG OPTION=n	
INT64=on/off	on
INT7A=on/off	on
IPATCH=byte offset, value	
IPX PACKET SIZE LIMIT=n	4160 or set by each LAN driver
IPX RETRY COUNT=n	20 retries
IPX SOCKETS=n	20 sockets
SPX ABORT TIMEOUT=n	540 ticks (≈30 seconds)
SPX CONNECTIONS=n	15 connections
SPX LISTEN TIMEOUT=n	108 ticks (≈6 seconds)
SPX VERIFY TIMEOUT=n	54 ticks (≈3 seconds)

## SHELL.CFG parameter defaults (continued)

Parameter	Default
<b>Parameters Used by EMSNETx.EXE</b>	
ENTRY STACK SIZE=n	10
<b>Parameters Used by NETx.COM</b>	
ALLSERVERS=on/off	off
CACHE BUFFERS=n	5 cache blocks
EOJ=on/off	on
FILE HANDLES=n	40 open files
HOLD=on/off	off
LOCAL PRINTERS=n	number of ports
LOCK DELAY=n	1
LOCK RETRIES=n	3
LONG MACHINE TYPE=name	IBM PC
MAX CUR DIR LENGTH=n	64
MAX PATH LENGTH=n	255
MAX TASKS=n	31
PATCH=byte offset, value	
PREFERRED SERVER=name	
PRINT HEADER=n	64 bytes
PRINT TAIL=n	16 bytes
READ ONLY COMPATIBILITY=on/off	off
SEARCH MODE=n	1
SET STATION TIME=on/off	on
SHARE=on/off	on
SHORT MACHINE TYPE=name	IBM
SHOW DOTS=on/off	off
SPECIAL UPPERCASE=on/off	off
TASK MODE=n	2

## SHELL.CFG parameter defaults (continued)

---

Parameter	Default
<b>Parameters Used by NETBIOS.EXE</b>	
NETBIOS ABORT TIMEOUT=n	540 ticks (30 seconds)
NETBIOS BROADCAST COUNT=n	2
NETBIOS BROADCAST DELAY=n	18 ticks (1 second)
NETBIOS COMMANDS=n	12
NETBIOS INTERNET=on/off	on
NETBIOS LISTEN TIMEOUT=n	108 ticks (6 seconds)
NETBIOS RECEIVE BUFFERS=n	6 buffers
NETBIOS RETRY COUNT=n	10 ticks (1 second)
NETBIOS RETRY DELAY=n	10 ticks (1 second)
NETBIOS SEND BUFFERS=n	6 buffers
NETBIOS SESSIONS=n	32 sessions
NETBIOS VERIFY TIMEOUT=n	54 ticks (3 seconds)
NPATCH=byte offset, value	

## **SHELL.CFG parameters affecting IPX.COM**

### **CONFIG OPTION parameter**

This parameter overrides the configuration options chosen during the SHGEN or WSGEN program. This parameter does not permanently change the IPX file, but only changes the configurations within the workstation RAM. Use this parameter to change the network board's configuration options temporarily without running SHGEN or WSGEN (such as when you find a possible conflict and want to see if a new configuration option will solve the problem). If the configuration option must be changed permanently, reconfigure the IPX file through the SHGEN or WSGEN program.

**Default: The option is set during SHGEN or WSGEN**

### **INT64 parameter**

This parameter allows applications to use interrupt 64h to access IPX services. IPX now uses interrupt 64h to be compatible with earlier versions of NetWare (version 1.x). If an application's documentation requests the use of interrupt 64h or if you have an application that works on an earlier version of NetWare but hangs on NetWare 3.0, set this parameter to off.

**Default: ON**

### **INT7A parameter**

This parameter allows applications to use interrupt 7Ah to access IPX services. IPX uses interrupt 7Ah to be compatible with NetWare version 2.0a. If an application's documentation requests the use of

interrupt 7Ah or if you have an application that works on earlier versions of NetWare but hangs on NetWare 3.0, set this parameter to off.

**Default: ON**

### **IPATCH parameter**

This parameter allows you to patch any address in the IPX.COM file with any specified value.

**Default: not used unless specified**

### **IPX PACKET SIZE LIMIT parameter**

Use this parameter to reduce the maximum packet size set by each LAN driver. Even though the LAN driver can send 16-KByte packets on the wire, the wasted memory for most operations may be unacceptable. The optimum packet size for Token-Ring drivers is 4,160 bytes. For Ethernet, the optimum is 1,500 bytes.

Reduce the maximum packet size if you receive "out of memory" errors at the workstation.

---

**Note:** IPX PACKET SIZE is a new feature, and not all drivers will support it.

---

Specify from 576 to 6,500 (bytes).

**Default: The minimum of either 4,160 or the size specified by the LAN driver.**

### **IPX RETRY COUNT parameter**

This parameter sets the number of times the workstation sends a packet. You may want to increase this retry count on networks that lose many packets. IPX does not actually try again to send a packet. It uses this count to recommend the number of retries to the DOS shell, SPX, and NetBIOS. Increasing this number causes a longer delay for some network functions, such as establishing a NetBIOS session or registering a NetBIOS name.

**Default: 20 retrles**

### **IPX SOCKETS parameter**

This parameter sets the maximum number of sockets IPX can have open at the workstation. An IPX-specific program such as PC Chalkboard Plus from LAN FAN, Inc. may require more than the default number of sockets.

**Default: 20 sockets**

### **SPX ABORT TIMEOUT parameter**

This parameter sets the amount of time that SPX waits, without getting a response from the other side of the connection, before it ends the session. The timeout number is in ticks (IBM Pcs and compatibles count 18.21 ticks per second).

**Default: 540 ticks (≈30 seconds)**

### **SPX CONNECTIONS parameter**

This parameter sets the maximum number of SPX connections a workstation can use at once.

**Default: 15 connections**

### **SPX LISTEN TIMEOUT parameter**

This parameter sets how long SPX waits, without getting a packet from the other side of the connection, before it sends a request. This request asks the other side to send back a packet assuring the connection is still valid. If SPX has not heard from the other side of the connection within this time period, it sends packets to the other side asking for verification that the connection still exists. The timeout number is in ticks (IBM PCs and compatibles count 18.21 ticks per second).

**Default: 108 ticks (~6 seconds)**

### **SPX VERIFY TIMEOUT parameter**

This parameter sets the frequency that SPX sends a packet to the other side of a connection saying that its side is still alive. If the software that establishes the session exchanges no packets on the SPX connection, SPX sends packets at regular intervals to make sure the connection is still working. The timeout number is in ticks (IBM PCs and compatibles count 18.21 ticks per second).

**Default: 54 ticks (~3 seconds)**

## **SHELL.CFG parameters affecting EMSNETx.EXE**

### **ENTRY STACK SIZE parameter**

Use this parameter to ensure that the code residing in expanded memory is visible in the memory page frame. Many terminate-and-stay-resident programs and other programs using expanded memory may need this parameter increased. The range is from 5 to 40.

**Default: 10**

## **SHELL.CFG parameters affecting NETx.COM**

### **ALL SERVERS parameter**

This parameter determines whether the "End of Task" is sent to all connected servers or only those servers interacting with the task. When turned on, it sends "End of Task" to all connected servers. When turned off, it sends "End of Task" only to those servers the current process has interacted with.

**Default: OFF**

### **CACHE BUFFERS parameter**

This parameter sets how many 512-byte buffers the shell uses for local caching of non-shared, non-transaction-tracked files. Increasing the number of cache buffers can speed up the process of sequential reads.

**Default: 5 cache blocks**



### **EOJ parameter**

This parameter specifies whether files, locks, semaphores, etc. are closed automatically at the end of a job.

**Default: ON**

### **FILE HANDLES parameter**

This parameter sets how many files a workstation can have open on the network at once. The DOS CONFIG.SYS file handles this setting for a local application. Some applications ask for more than the default of 40 open files. If you get many error messages that say no available files, you might try increasing the value of this parameter.

**Default: 40 open files**

### **HOLD parameter**

This parameter controls whether workstation files remain open if they were accessed and then closed. If this parameter is on, all files opened by a program remain open until the program exits. Older versions of applications that use FCB\_IO need this parameter set to on.

**Default: OFF**

### LOCAL PRINTERS parameter

This parameter overrides the number of local printers on the workstation, normally set by BIOS. BIOS recognizes a local printer for each parallel port. Setting the number of local printers to 0 prevents the workstation from hanging if it gets a print command without a local printer or spooling.

**Default: not used**

### LOCK DELAY parameter

This parameter sets the amount of time (in ticks) the shell waits before retrying to get a lock. When many users commonly access a file at once, the shell may be unable to gain access before its allotted wait time. If a workstation often gets error messages when requesting a file, try increasing the value of this parameter.

---

**Note:** For lock types that do not have a wait ability, the LOCK DELAY number is the amount of time the workstation waits for a lock. For locks that have a wait ability, the wait time is calculated by multiplying the LOCK DELAY number by twice the LOCK RETRIES number. The resulting number is the time the workstation waits for a lock.

---

**Default: 1**

### LOCK RETRIES parameter

This parameter sets the number of times the shell tries to get a lock on the network. This parameter is part of an equation which figures the total time the shell waits while trying to access a locked file. If a

workstation often gets error messages when requesting a file, try increasing the value of this parameter.

**Default: 3**

### **LONG MACHINE TYPE parameter**

This parameter (six characters or less) tells the shell what type of machine is accessing the %MACHINE variable (see "Login Script Commands" in *NetWare for AViiON® Series Systems: Installation*). Login scripts use it when setting the machine's search path to the correct version of DOS (see "Installing DOS on the network" in *NetWare for AViiON® Series Systems: Installation*). Select the Long Machine Type from the DOS directories created by the supervisor.

**Default: IBM\_PC**

### **MAX CUR DIR LENGTH parameter**

DOS defines the "Get Current Directory" call to return 64 bytes of path. In the past, the shell has allowed 128 bytes to be returned. To provide compatibility both ways, this parameter is now configurable. The numeric range is from 64 to 255.

**Default: 64 bytes**

### **MAX PATH LENGTH parameter**

DOS defines a valid ASCII string as 128 bytes, but this is insufficient for some network paths. This parameter can be changed to allow users to have paths of up to 255 characters. This path does not include file server or filenames. The numeric range is from 64 to 255.

**Default: 255 bytes**

### **MAX TASKS parameter**

This parameter sets the maximum number of tasks that are active at once. Some multi-tasking applications such as Windows and DESQview allow many different programs to run at once. If you use these applications and find you can't start a new program, try increasing the value of this parameter. The numeric range is from 20 to 128.

**Default: 31 tasks**

### **PATCH parameter**

This parameter allows any address in the shell to be patched with any value. Use this parameter if you find a shell problem that you can fix by changing some bytes in the programming. Patch allows you to specify the bytes and insert the correct values.

**Default: This option is not used unless specified**

### **PREFERRED SERVER parameter**

This parameter sets the server that you will attach to and further ensures your connection to the network. Normally, the shell attaches to the nearest server. With this parameter set, the shell attempts to poll up to five servers for an available connection. Then, if the server specified in the parameter has a connection available, the shell attaches to that server. The shell then attempts to connect to the specified server.

**Default: There is no preferred server**

### **PRINT HEADER parameter**

This parameter sets the size of the printer initialization buffer for each print job. If you send print jobs with many instructions in the header (such as initializing a printer for an emulated mode, changing defaults, font selections, page length, or orientation) and the printer does not deliver all the requested attributes, try increasing the size of the print header. The range is from 0 to 255.

**Default: 64 bytes**

### **PRINT TAIL parameter**

This parameter sets the size of the buffer which holds the information that resets the printer after a print job. If your printer does not clean up or reset after each print job, try increasing the print tail size. The range is from 0 to 255.

**Default: 16 characters**

### **READ ONLY COMPATIBILITY parameter**

This parameter controls whether a write-access call can open a file marked Read Only. Some applications need this parameter on.

In early versions of NetWare, a program could open a Read Only file with write access and not get an error, though trying to write to the file produced an error. To be compatible with DOS, NetWare no longer allows opening a Read Only file for write access. Setting the Read Only Compatibility to ON causes the shell to revert to the old mode and allows the open request to succeed.

**Default: OFF**

### SEARCH MODE parameter

This parameter sets the shell's method for finding a file outside the current directory. Most .EXE and .COM files need a specific search mode to locate files in a directory structure. When using the Search Mode parameter, select the search mode that works correctly with the majority of your .EXE and .COM files. Then use the SMODE command to alter the search mode of any files requiring another mode. The SMODE command overrides the SHELL.CFG parameter for each file specified. (See "SMODE" in *NetWare for AViiON® Series Systems: Utilities*.)

#### Default: 1

The valid search modes for the SHELL.CFG file are described below.

- Mode 0** No search instructions. Mode 0 is the default setting for all executable files.
- Mode 1** If the executable file itself specifies a path leading to the data file, the executable file searches only that path. If a path is not specified, the executable file searches the default directory and then all search drives.
- Mode 2** The executable file searches only the default directory.
- Mode 3** If the executable file specifies a path leading to the data file, the executable file searches only that path. If a path is not specified and the executable file opens data files flagged Read Only, the executable file searches the default directory and then all search drives.

## Parameters affecting NETx.COM (continued)

---

- Mode 4** Reserved.
- Mode 5** The executable file searches the default directory and all search drives whether or not the executable file specifies the path.
- Mode 6** Reserved.
- Mode 7** If the executable file opens data files flagged Read Only, the executable file searches the default directory and all search drives whether or not the executable file specifies the path.

---

**Note:** The default drive must be a network drive for SEARCH MODE to function properly.

---

### SET STATION TIME parameter

The shell normally synchronizes the workstation time with the file server's time. If you don't want this to occur, set this parameter to OFF.

**Default: ON**

### SHARE parameter

This parameter, set to on, allows a child process to inherit all the resources of its parent process. For example, a child process can inherit the parent's file handles rather than having new file handles created.

**Default: ON**

**SHORT MACHINE TYPE parameter**

The shell uses this parameter (four characters or less) when accessing the %SMACHINE variable). Examples of files using this parameter include the IBM\$RUN.OVL file for the windowing utilities and CMPQ\$RUN.OVL file, which uses a default black and white color palette for NetWare menus.

**Default: IBM**

**SHOW DOTS parameter**

The NetWare file server does not have directory entries for "." and ".." as DOS does. The shell is able to emulate these entries on FindFirstMatching and FindNextMatching DOS calls.

**Default: OFF**

---

**Note:** For Windows 3.0, set SHOW DOTS=ON.

---

**SPECIAL UPPERCASE parameter**

The shell normally does no uppercase translation of ASCII characters above 128. Setting this parameter to ON causes the shell to call DOS for this translation. This is used for foreign language and special characters.

**Default: OFF**



### **TASK MODE parameter**

This parameter sets the way the shell creates, switches, and destroys tasks. The default works with Windows 3.0. If you use an earlier version of Windows or any multitasking program, set the task mode to 1. If you do not, set the task mode to 0. If you switch between a multitasking program and regular DOS programs, set the task mode to 1.

**Default: 2**

## **SHELL.CFG parameters affecting NETBIOS.EXE**

### **NETBIOS ABORT TIMEOUT parameter**

This parameter adjusts the time NetBIOS waits, without getting any response from the other side of a session, before it ends the session. Increase this value (along with NETBIOS RETRY COUNT and NETBIOS RETRY DELAY) if there are NetBIOS nodes across asynchronous lines or large internetworks. The timeout number is in ticks (IBM PCs and compatibles count 18.21 ticks per second).

**Default: 540 ticks (~30 seconds)**

### **NETBIOS BROADCAST COUNT parameter**

This parameter, multiplied by the NETBIOS BROADCAST DELAY number, determines the total time it takes to broadcast a name resolution packet across the network. This number reflects the size of your network or internetwork. Increase this value if you

- Have many LAN segments on the network with nodes that need NetBIOS support.
- Cannot attach to a gateway.

This value is automatically reduced if NETBIOS INTERNET = OFF. Specify any value from 2 to 65,535

**Default: 4 (when NETBIOS INTERNET = ON)**  
**Default: 2 (when NETBIOS INTERNET = OFF)**

### **NETBIOS BROADCAST DELAY parameter**

This parameter, multiplied by the NETBIOS BROADCAST COUNT number, determines the total time (in ticks) it takes to broadcast a name resolution packet across the network. This value reflects the traffic of the network. The default is usually sufficient in most cases. Increase this value if the packet loss rate is higher or if the traffic is high; however, reduce the NETBIOS BROADCAST COUNT by a similar amount to maintain the same name resolution timeout value.

This value is automatically reduced if NETBIOS INTERNET = OFF. Specify any value from 18 to 65,535.

**Default: 36 (when NETBIOS INTERNET = ON)**

**Default: 18 (when NETBIOS INTERNET = OFF)**

### **NETBIOS COMMANDS parameter**

The number of commands needed may vary between applications. The number may be set from 4 to 250. In most cases, the default setting of 12 is sufficient. However, if a NetBIOS command error 22 occurs, increase this parameter. Most applications ignore this error and retry if a NetBIOS command is unavailable. In this case, increasing the number of commands would improve application performance. If you need to know specifics, contact the software application developers to find out how many commands they require.

**Default: 12 commands**

### **NETBIOS INTERNET parameter**

If you are running NetBIOS applications on a single network with a dedicated file server, this parameter can speed up the delivery of datagram packets when its value is set to off. If you are running on more than one network or LAN segment and are communicating through bridges, or if you are running a nondedicated file server, the value must remain at the default ON.

**Default: ON**

### **NETBIOS LISTEN TIMEOUT parameter**

This parameter adjusts the time that NetBIOS waits, when no packets are received from the other side of a session, before it requests a "keep-alive" packet from the other side to assure the session is still valid. If NetBIOS has not heard from the other side within this time period, it requests that the other side respond immediately. NetBIOS continues to send these requests to the other side at an interval specified by the NETBIOS VERIFY TIMEOUT command until the timeout specified by NETBIOS ABORT TIMEOUT has expired. The timeout number is in ticks (IBM PCs and compatibles count 18.21 ticks per second). Specify from 1 to 65,535 ticks.

**Default: 108 ticks (~6 seconds)**

### **NETBIOS RECEIVE BUFFERS parameter**

This parameter sets the number of IPX receive buffers that NetBIOS uses. Increase this value if software is "client-server" oriented, where a many-to-one relationship exists, or where incoming burst traffic situations are common (for example, a 3270 gateway). Specify any value from 4 to 20.

**Default: 6 buffers**

**NETBIOS RETRY COUNT parameter**

This parameter affects NetBIOS session commands only. The retry count determines the number of times NetBIOS resends a packet to establish a session with a remote partner. Adjust this value with the NETBIOS RETRY DELAY to vary the timeout on establishing NetBIOS sessions. This number reflects the size of the network or internetwork. Increase this value if you

- Have many LAN segments on the network with nodes that need NetBIOS support.
- Cannot attach to a gateway.

This value is automatically reduced if NETBIOS INTERNET = OFF. Enter values from 10 to 65,535.

**Default: 20 (when NETBIOS INTERNET = ON)**

**Default: 10 (when NETBIOS INTERNET = OFF)**

### **NETBIOS RETRY DELAY parameter**

This parameter affects NetBIOS session commands only. Retry delay sets the delay (in ticks) between each packet NetBIOS sends during an attempt to establish a session. It sends the request (and waits to send the next request) the number of times indicated by the NETBIOS RETRY COUNT. This value reflects the size of the network or internetwork you are working on. Increase this value if you

- Have many LAN segments on the network with nodes that need NetBIOS support.
- Cannot attach to a gateway.

Specify any value from 10 to 65,535.

**Default: 10 ticks (≈.5 second)**

### **NETBIOS SEND BUFFERS parameter**

This parameter sets the number of IPX send buffers that NetBIOS uses. Increase this value if software is "client-server" oriented, where a many-to-one relationship exists, or where incoming burst traffic situations are common (for example, a 3270 gateway). Specify any value from 4 to 20.

**Default: 6 buffers**

### **NETBIOS SESSIONS parameter**

This parameter sets the maximum number of virtual circuits that NetBIOS can support at the same time. Specify any value from 4 to 250.

**Default: 32 sessions**

### **NETBIOS VERIFY TIMEOUT parameter**

This parameter sets the frequency that NetBIOS sends a "keep-alive" packet to the other side of a session to preserve the session. If the software that established the session exchanges no packets on the NetBIOS session, NetBIOS sends packets at regular intervals to make sure the session is still valid. The timeout number is in ticks (IBM PCs and compatibles count 18.21 ticks per second). Specify any value from 4 to 65,535.

**Default: 54 ticks (~3 seconds)**

### **NPATCH parameter**

This parameter patches any location in the NETBIOS.EXE data segment with any value.

**Default: This option is not used unless specified**

End of Chapter





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