

This chapter contains some tips about using a network with Microsoft Windows 3.1, plus notes about using specific networks with Windows.

Related information

- *Windows User's Guide*: "Managing Network Printing" in Chapter 6, "Print Manager"; Appendix A, "Windows and Networks"
See also Chapter 1, "Setting Up Windows," and Chapter 4, "Troubleshooting," in the *Getting Started* booklet, and the NETWORKS.WRI file in your WINDOWS directory
- *Windows Resource Kit*: "Troubleshooting Networks" in Chapter 13, "Troubleshooting Windows 3.1"; "PC-NFS and Windows 3.1" in Appendix D, "Articles"

Contents of this chapter

About Networks and Windows 3.1.....	368
Running a Shared Copy of Windows.....	368
Memory, Windows, and the Network.....	370
Creating Custom User Environments.....	374
3Com Networks.....	374
Artisoft LANTastic.....	376
LANTastic Versions 3.x.....	376
LANTastic Versions 4.x.....	377
Banyan VINES.....	377
Banyan VINES 4.0x.....	378
Banyan VINES 4.1x.....	378
DEC Pathworks.....	379
DEC Pathworks 4.1.....	379
Questions and Answers about DEC Pathworks.....	381
IBM OS/2 LAN Server.....	383
IBM PC LAN Program.....	383
Invisible Software—NET/30 For Windows.....	384
Microsoft LAN Manager Networks.....	384

Microsoft Network and Compatibles.....	387
Novell NetWare.....	387
TCS 10Net.....	392
Ungermann-Bass Net/One.....	392

About Networks and Windows 3.1

W

These changes affect how you can install and use Windows 3.1 with a network:

- You can use **Setup /a**, the Administrative Setup option, to easily install the files for a shared copy of Windows on a network. For details, see “Setting Up Windows for a Network” in Chapter 1, “Windows 3.1 Installation.”
- You can create a script to automate Windows installation for multiple systems. For details, see “Using Automated Setup” in Chapter 1, “Windows 3.1 Installation.”
- For networks, the network connection is made automatically when you run Windows, and related menu items appear automatically to assist you with network activities related to file management.
- You can use long file names on network servers, if the driver for your network supports this feature.

This chapter contains information about these specific networks:

3Com networks	Invisible Software—NET/30 for
Windows	
Artisoft LANTastic	Microsoft LAN Manager Networks
Banyan VINES	Microsoft Network (MS-Net) and
compatibles	
DEC Pathworks	Novell NetWare
IBM OS/2 LAN Server	TCS 10Net
IBM PC LAN Program	Ungermann-Bass Net/One

If your network is not listed here, it may be based on or equivalent to another network. For example, many networks are based on Microsoft Network. For tips about using PC-NFS with Windows 3.1, see the related article in Appendix D.

Running a Shared Copy of Windows

*Flowchart 5.2
Cannot Run 386
Enhanced Mode on
Network Workstation*

Make sure the user's personal WINDOWS directory and the shared WINDOWS directory are on the user's path, and in that order. The Setup program will automatically take care of this if the user chooses to have Setup make modifications to the AUTOEXEC.BAT file.

For some networks, MS-DOS SHARE.EXE must not be loaded on a workstation to run a shared copy of Windows. If a user has problems running a shared copy, remove the command line that loads SHARE.EXE from the user's system.

You might need to mark applications stored on a network directory as read-only to prevent sharing violations when they are run by more than one user at a time. You can set the read-only attribute from within Windows File Manager or by using the MS-DOS **attrib** command. (Your network may also have an attribute program that you can use.) Most applications require read-only status before they can be shared.

If the user chooses to have Setup make modifications to AUTOEXEC.BAT, Windows Setup modifies AUTOEXEC.BAT to make sure the WINDOWS directory appears on the path ahead of any conflicting directories. However, because of the way some networks implement their startup procedures, a network can change this path when a user logs on. If this happens, modify the network logon procedure so that the paths are set correctly in Windows.

Also, verify user rights for the directories where any Windows .INI and .GRP files are located, and verify that any shared .GRP files are marked read-only. Ensure that the mapping for all network drives is correct and that all search drives are correctly designated.

Using a Diskless Workstation

Print Manager spools print jobs to the location of the MS-DOS TEMP environment variable. If a value for TEMP is not set, Print Manager defaults to the root directory of drive C. For diskless workstations, set the TEMP variable either to a RAM disk or to the location of a network directory. The user should have full and private access to this directory. The TEMP variable is set by placing a **set TEMP=** statement in the AUTOEXEC.BAT file or network logon script. For example, to spool to the network directory X:\USERTEMP, you would add this statement to AUTOEXEC.BAT:

```
set temp=x:\usertemp
```

Each user must have a personal TEMP directory.

Maintaining Windows with a Network

If the system administrator or a user changes the network configuration by running Setup after Windows has been installed, Setup might not be able to remove all support for the previous network selection. Check the network notes later in this chapter for details about .INI file changes made for your network.

Other items to consider in maintaining Windows on a network:

- Windows does not support the execute-only permissions provided by several networks. These permission settings work for applications run outside of Windows, but neither execute-only Windows applications nor non-Windows applications can be run from within Windows.
- To view a directory where the user does not have access to the parent directory, set the current working directory to a visible directory before starting Windows. For more information, see your network documentation. File Manager displays the current directory and any subdirectories, regardless of whether the parent directory can be displayed.
- If you connect to a network drive that supports long filenames, you will be able to see the long filenames in a directory window. Using File Manager, you can move and copy files with long filenames. However, you cannot perform other operations on them, such as opening or running. If you move or copy a file with a long filename to a directory that doesn't support long filenames, File Manager will propose a shorter name. Extended attributes are preserved when you move or copy files with long filenames.

Memory, Windows, and the Network

This section presents details about specific `SYSTEM.INI` entries and other elements of managing memory when using Windows 3.1 with a network.

Windows Setup and Pop-up Messages

Many networks have pop-up message facilities so you can see messages sent from other servers or workstations. In most cases, these pop-up programs will cause Windows Setup to fail if a message is received while Windows is being installed. Many networks provide utilities that allow them to work with Windows after installation, but these are generally not available during Setup. You should make sure any such pop-up service is disabled before installing Windows. Please consult specific entries regarding your network in the sections later in this chapter, or consult your network documentation for instructions.

SYSTEM.INI Settings for Networks

If you are having problems running Windows in 386 enhanced mode, you may need to change the way Windows and your network are set up to use memory. Several SYSTEM.INI entries affect how Windows interacts with a network. You can change the following entries to correct most problems you might have operating Windows with a network.

<i>Section</i>	<i>Entries</i>	<i>Entries</i>
[boot]	Network.drv=	
[standard]	Int28Filter=	NetHeapSize=
[386enh]	AllVMsExclusive=	TokenRingSearch=
	NetAsynchFallback=	InDOSPolling=
	ReflectDOSInt2A=	Network=
	EMMExclude=	UniqueDOSPSP=
	NetAsynchTimeout=	Int28Critical=
	TimerCriticalSection=	PSPIncrement=
	FileSysChange=	NetHeapSize=
	NetDMASize=	

For information about these entries and how to edit SYSTEM.INI, see Chapter 4, “The Windows Initialization Files.”

Specifying SYSTEM.INI Settings After Using Setup

If you use Setup to change your network configuration after you have already installed Windows, unnecessary files might be left in your WINDOWS directory, and entries might be left in your WIN.INI or SYSTEM.INI files that could harm your system’s performance. Setup leaves these files because it cannot be sure they are not still required by other components in your system.

After changing your configuration with Setup, you should check the network-specific notes about both your previous and new system settings to see if any previous changes are no longer required. For example:

- Some networks require the **TimerCriticalSection=** entry in the **[386enh]** section of SYSTEM.INI to be set to a value of **1** or greater.
- Some network adapter cards require the **ReservedHighArea=** or the **EMMExclude=** entry in the **[386enh]** section of SYSTEM.INI to be set to the memory range used by the card. These cards will probably also require an **x=** switch on the EMM386 command line in your CONFIG.SYS file. For more information about EMM386.EXE, see Chapter 14, “Optimizing Windows,” in the *Windows User’s Guide*.

- Some network cards and some network transport stacks require special handling. Consult the sections below for the manufacturer of your network and for the manufacturer of your network adapter and transport stack.

Changing Memory Settings

The network may require a larger buffer for direct memory access (DMA) data transfers than Windows usually provides. Or your network may not be able to run unless Windows is prevented from using UMBS in the upper memory area.

To change the size of the direct memory access buffer:

- In the **[386enh]** section of SYSTEM.INI, add or modify the **NetDMASize=** entry to specify how much memory (in kilobytes) Windows should reserve for direct memory access.

The default value is **0** for ISA machines (IBM PC/AT or compatible) and **32** for Micro Channel machines (IBM PS/2 or compatible). For example, if you want Windows to provide a 32K buffer for direct memory access, specify **NetDMASize=32**.

If an application does not run correctly (in either standard or 386 enhanced mode), you may have to increase the buffer for transferring data over the network.

To increase the size of the data transfer buffer:

- In the **[standard]** or **[386enh]** section of SYSTEM.INI (depending on the mode where you're having problems), modify the **NetHeapSize=** entry to specify the maximum buffer size (in kilobytes) required for data transfers.

The default value is **8** in the **[standard]** section and **12** in the **[386enh]** section. All values are rounded up to the nearest 4K. For example, to make the buffer size 16K, specify **NetHeapSize=16**.

To prevent Windows from scanning a part of memory:

- In the **[386enh]** section of SYSTEM.INI, set a value for **EMMExclude=** or **ReservedHighArea=** to specify a range of upper memory addresses that Windows should not scan or use.

For details about this process, see "Optimizing Use of the UMBS" in Chapter 6, "Tips for Configuring Windows 3.1."

The **PSPIncrement=** and **UniqueDOS PSP=** entries in SYSTEM.INI can also affect how Windows uses memory.

Disabling File-Handle Caching

By default, Windows keeps a minimum of 14 handles open, which may limit the number of users that can run a shared copy of Windows from a single server. You can modify SYSTEM.INI to decrease the number of cached file handles. The minimum is 2. If you decrease the number of cached file handles, Windows may slow down, but more users should be able to access Windows from a single server.

To decrease the number of cached file handles, set the value of the entry **CachedFileHandles=** in the **[boot]** section of SYSTEM.INI. For your network, you may also be able to increase the number of file handles available on the server.

Running Non-Windows Applications

If you have problems running a network-specific application that is a non-Windows application, you may need to run the application in exclusive mode. You can use PIF Editor to do this. If the application creates or deletes files, it may not be running exclusively even if it has been set to run in exclusive mode. This is because Windows is alerted every time a file is manipulated. You can prevent this alert by setting **FileSysChange=no** in the **[386enh]** section of SYSTEM.INI.

If you have problems running a non-Windows application or running the MS-DOS Prompt, you may need to adjust the **TimerCriticalSection=** entry in the **[386enh]** section of SYSTEM.INI. The **TimerCriticalSection=** value prevents switching or multitasking for a specified time period (in milliseconds), ensuring that only one non-Windows application at a time receives timer interrupts. For example, to specify a 10,000 millisecond time-out, set **TimerCriticalSection=10000**.

Note

Using the **TimerCriticalSection=** entry may slow down Windows.

Other Memory Considerations

If a user has problems running Windows or other applications with network software loaded in the high memory area (the HMA, or first 64K of extended memory), try disabling the network's HMA option. Consult your network documentation for more information.

Some memory managers, such as EMM386, 386MAX, and QEMM, can load networks and other device drivers in the upper memory area. If the network is loaded in the upper memory area and a user has problems running Windows, try loading the network in conventional memory.

Creating Custom User Environments

W

There are other options available for setting up a user's environment:

- If you have many workstations to set up, you may want to create a master `PROGMAN.INI` file with the settings you want and then have the file copied to the user's `WINDOWS` directory during Setup. For more information about copying files during Setup, see “Modifying .INF Files for Custom Installations” in Chapter 2, “The Windows Setup Information Files,” and see “Other Windows Initialization Files” in Chapter 4, “The Windows Initialization Files.” The `PROGMAN.INI` file that gets copied during Setup will overwrite any existing `PROGMAN.INI` file in the user's `WINDOWS` directory.
- You can specify Program Manager restrictions by modifying the `PROGMAN.INI` file. You can disable some of the commands in Program Manager, remove the File menu altogether, or specify other restrictions, depending on the functionality you want users to be able to access. For information, see “Configuring Program Manager for a Network Workgroup” in Chapter 6, “Tips for Configuring Windows 3.1.”
- You can also set up shared Program Manager groups and change the name of the Startup group. For information, see “Setting Up Shared Program Manager Groups” in Chapter 6, “Tips for Configuring Windows 3.1.”

- You can use environment variables in PIFS so that you can create a single PIF to be used on various workstation configurations. For more information about PIFS, see Chapter 7, “Non-Windows Applications,” in the *Windows User’s Guide*.
- You can set up password protection for a workstation by using a screen saver with a password. For more information, see “Using a Screen Saver” in Chapter 5, “Control Panel,” in the *Windows User’s Guide*.

3Com Networks

Windows Setup recognizes the following 3Com networks:

- The 3Com 3+Share network is based on Microsoft Network (MS-Net) and will be handled as such by Windows. See the “Microsoft Network and Compatibles” section later in this chapter.
- The 3Com 3+Open LAN Manager network is based on Microsoft LAN Manager and will be handled as such by Windows. See the “Microsoft LAN Manager Networks” section later in this chapter.

When you install Windows for 3Com 3+Share or 3Com 3+Open LAN Manager, Setup adds these entries to the **[386enh]** section of SYSTEM.INI:

```
TimerCriticalSection=10000  
UniqueDOSPPS=true  
PPSIncrement=5
```

The following items should also be noted in relation to 3Com networks:

- Some copies of 3Com 3+Open LAN Manager version 1.1 will require a maintenance upgrade to work with Windows. If you have problems, contact your network customer support organization.
- When you install Windows, Setup modifies your AUTOEXEC.BAT file to make sure the WINDOWS directory appears on your path ahead of any conflicting directories. However,

because of the way that 3+Share implements its startup procedures, the network might change this path when you log on. If so, the system administrator must modify the network logon procedure so that the paths are set correctly to run Windows.

- On a 3Com 3+Open network, the user's name displayed by Print Manager might not match the user's actual logon name.
- Some 3Com 3Station diskless workstations come with an All ChargeCard. Make sure your machine is not configured to load the network into the upper memory area, because you will not be able to install Windows or work reliably with Windows standard mode if your system is configured in this manner.
- If you use the 3C505 Network Adapter Card, you must disable the 3Com Link Plus to run Windows in 386 enhanced mode. You can disable it by removing the following lines from your CONFIG.SYS file:

```
device=psh.sys <arguments>  
device=pth.sys
```

Also, remove the following line from your AUTOEXEC.BAT (or other batch file you use to start your network):

```
LDR
```

- Windows does not support the 3Com network aliasing scheme (three-part names).

Artisoft LANtastic

LANtastic versions below 3.0 are not compatible with Microsoft Windows.

LANtastic Versions 3.x

If you are running LANtastic versions 3.x you cannot run Windows 386 enhanced mode on a nondedicated server.

If you install Windows for LANTastic 3.x, Setup adds the following entries in the **[386enh]** section of SYSTEM.INI:

```
EMMExclude=D800-DFFF  
INDOSPolling=TRUE  
NetHeapSize=76
```

To print from Windows across LANTastic 3.x, you must either turn off the Fast Printing Direct To Port option in Control Panel or use the LPTx.DOS printing method.

To turn off the Fast Printing Direct To Port option in Control Panel:

1. Choose Printers option from Control Panel, and then choose the Connect button.
2. In the Connect dialog box, clear the Fast Printing Direct To Port check box.

When you turn off the Fast Printing Direct To Port option, it affects all ports.

To use the LPTx.DOS printing method:

1. If you are using LPT1 or LPT2 to print, you can use the **LPT1.DOS=** or **LPT2.DOS=** entries already in your WIN.INI file. If you upgraded from Windows 3.0, the WIN.INI entry appears as "LPTx.OS2."

If you are using LPT3 to print, add **LPT3.DOS=** to the **[ports]** section of the WIN.INI file.
2. Quit Windows and redirect the LPTx.DOS port by using the LANTastic NET USE command.
3. Restart Windows.
4. Choose the Printers icon in Control Panel, and change your printer port to LPTx.DOS.

If you have a network connection made on LPT1, you will not be able to see it in Print Manager or Control Panel.

LANTastic Versions 4.x

If you install Windows for LANTastic 4.x, you must have the LANTASTI.386 file somewhere on your path. This file should be in your LANTastic directory.

If you install Windows for LANTastic 4.x, Setup adds the following entries in the **[386enh]** section of SYSTEM.INI:

```
EMMExclude=D800-DFFF  
INDOSPolling=TRUE  
NetAsynchFallback=TRUE  
NetAsynchTimeout=50  
NetHeapSize=64  
PerVMFiles=0
```

The **EMMExclude=** entry is required for the default configuration of the Artisoft LANTastic Enhanced 2mbps network adapter. If you have changed the memory address setting on your adapter, you will need to modify this entry in SYSTEM.INI to reflect the appropriate address range. If you are not using this network adapter, you can remove the **EMMExclude=** entry.

Some commands, such as XCOPY, require that the **NetHeapSize=** entry in the **[standard]** and **[386enh]** sections of SYSTEM.INI be set higher than the default value. Increasing the **NetHeapSize=** value leaves less memory available for non-Windows applications, so only increase this value if necessary.

Banyan VINES

Setup will correctly handle the following Banyan VINES versions:

- Banyan VINES 4.0 is compatible with Microsoft Network (MS-Net), and will be handled as such by Windows.
- Banyan VINES 4.1 and above come with additional Windows components, which will be installed when you set up Windows for Banyan VINES 4.1.

Banyan VINES 4.0x

If you are running VINES 4.0 and want to run non-Windows applications that use NETBIOS, you must install VINES 4.00(5) or later. Also, you will need to start NETBIOS before starting Windows.

To use Windows printing functions over VINES 4.0, you must have VINES 4.00(5) or higher and must have the NETBIOS support loaded. If you cannot print to a network printer, the network administrator should verify that you are loading NETBIOS and that you are running the proper version of VINES.

If you are running VINES version 4.0x, and you have a problem with intermittent time-outs while printing, you can either update to VINES 4.1x, or use the VINES SETPRINT utility to remove the time-out on your printer port by specifying the following:

setprint lptn servicename /d:infinite

Lptn is the printer port and *servicename* is the name of the network print queue.

Banyan VINES 4.1x

When you install for Banyan VINES 4.1, Setup adds the following entries to the [386enh] section of SYSTEM.INI:

```
Network=*dosnet,*vnetbios,vvinesd.386
TimerCriticalSection=5000
UniqueDOSPPS=TRUE
PPSIncrement=5
```

If you are running Banyan VINES 4.10 or 4.11, you do not need to load NETBIOS unless you are running NETBIOS-specific applications. If you are running version 4.11, you can load NETBIOS either before starting Windows or after starting Windows. For more information on running memory-resident applications after starting Windows, see Chapter 7, “Non-Windows Applications,” in the *Windows User’s Guide*.

If you are running version 4.10 and you want to run NETBIOS-specific applications, you must start NETBIOS before starting Windows. However, currently you can only run one NETBIOS application at a time.

DEC Pathworks

Windows 3.1 supports DEC Pathworks versions 4.0 and above.

When you set up Windows for a DEC Pathworks network, the following entries are added to the **[386enh]** section of SYSTEM.INI:

```
Network=*dosnet, decnet.386, decnb.386  
TimerCriticalSection=10000
```

If you configured your remote-boot workstation to run Windows 3.0, you will be loading a program called RIPLMEM.EXE in your AUTOEXEC.BAT. This program is no longer required for running Windows 3.1, so Setup will remove it from your AUTOEXEC.BAT file when you set up Windows. If this program is not being loaded from your AUTOEXEC.BAT file, you or the system administrator should remove it manually.

DEC Pathworks supports additional APIs that are not supported by the files installed by Windows 3.1.

DEC Pathworks 4.1

The following guidelines will help you when you use Windows 3.1 with DEC Pathworks 4.1:

- To access DEC Pathworks network services from Microsoft Windows, make sure that you have run the WIN3SETU utility and responded Yes to the prompt: “Do you wish to access PATHWORKS network services under Windows 3.0?”

If your PC has access to a DEC Pathworks network driver, a Network icon is displayed in the Windows Control Panel. If you click this icon, a message box appears, “Windows 3.0 Network Driver for PATHWORKS,” followed by a version number. If your PC does not have access to a DEC Pathworks

network driver, no Network icon is displayed in the Control Panel, and you must run the WIN3SETU utility.

- While you run Windows, make sure no interrupt (IRQ) conflicts occur. Interrupt conflicts that affect your PC's mouse or serial port may not be evident until you use Windows.
- When you run Netsetup in Intermediate or Advanced mode and specify the Basic Redirector, do not load the Basic Redirector into XMS memory.

- Do the following before using the VT320 terminal emulator application:

Type **set netwin=1** at the command prompt to set the MS-DOS environment variable NETWIN to 1.

Run Netsetup to load the LAT, CTERM, or TELNET network component into your PC's memory.

If you load LAT, use the LATCP DEFINE SCB command to define enough session control blocks (SCBs) to accommodate the number of terminal emulator sessions you want to run simultaneously. For example, if you want to run four terminal emulator sessions simultaneously, type **latcp define scb 4 4** at the command prompt.

- Your PC must use the latest SCSI adapter card (Adaptec 1540B) if your PC has a SCSI disk drive, your PC is a DECstation, and you load DEC Pathworks network components into the UMBS.

If all these conditions exist, make sure that your SCSI adapter card is an Adaptec 1540B (not 1540 or 1540A) and that the SCSIHA.SYS driver file is installed on your PC from the floppy diskettes that come with your DECstation. If your SCSI adapter card is an Adaptec 1540 or 1540A, replace it with the latest card.

- If your PC uses a third-party super VGA driver and the display does not work properly, install the standard VGA driver that Microsoft Windows provides. If the display works properly now, there is a problem with the third-party driver.
- Change the **files=** setting in your PC's CONFIG.SYS file to **40**. This setting allows Windows applications to have up to 40 MS-DOS files open simultaneously. You may need to change this setting to a higher value, depending on the applications you run.
- A PC that uses the IBM XGA or 8514 Windows drivers and that loads the DEC Pathworks broadcast receiver (RCV) will hang when it receives a broadcast message. In this case, replace the XGA or 8514 drivers with the IBM supplemental drivers kit that includes the standard VGA.DRV file.

Questions and Answers about DEC Pathworks

The following provides some answers for common questions about the DEC Pathworks device drivers included with Windows 3.1.

Q: Do the network device drivers that come with DEC Pathworks 4.1 work with Windows 3.1, or should I use the drivers included in Windows 3.1?

A: Although the network drivers in DEC Pathworks 4.1 work with Windows 3.1, it is best to use those included in Windows 3.1. The DEC Pathworks network driver PCSA.DRV that is included with Windows 3.1 provides specific support for Windows 3.1.

Q: I have already installed DEC Pathworks 4.1, and I am using the DEC Pathworks Windows network drivers that are included in that kit. What must I do to use the DEC Pathworks network drivers that are included in Windows 3.1?

A: Run Windows Setup. In the Network field of the Change System Settings dialog box, choose the DEC Pathworks (version 4.1 or higher) option. Windows 3.1 will install the DEC Pathworks network drivers included with Windows 3.1 and modify the appropriate entries in SYSTEM.INI.

Q: What is the difference between the DEC Pathworks network device drivers included with DEC Pathworks 4.1 and those included with Windows 3.1?

A: Windows 3.1 includes a new version of the DEC Pathworks network driver, called PCSA.DRV, that allows users to disable persistent connections, which is a new feature of Windows 3.1.

The virtual device drivers VDNET.386 and VNETBIOS.386 in with DEC Pathworks 4.1 are called DECNET.386 and DECNB.386, respectively, in Windows 3.1. VDNET.386 was changed to DECNET.386 to make it clear that the driver is a DECnet virtual device driver; VNETBIOS.386 was changed to DECNB.386 because Microsoft includes a driver called VNETBIOS.386 (which does not support Digital's enhanced NETBIOS functions) in Windows 3.1.

DECNET.386 and DECNB.386 improve network performance by changing synchronous socket calls to asynchronous socket calls. VDNET.386 and VNETBIOS.386 can also do this. But for VDNET.386 and VNETBIOS.386, you must add these entries to the **[386enh]** section of SYSTEM.INI:

- **DNETNoBlock=true** (for DECnet socket calls)
- **NetNoBlock=true** (for NETBIOS calls)

Q: If my client still runs DEC Pathworks 4.0, can I install the DEC Pathworks network drivers included with Microsoft Windows 3.1?

A: Yes. Run Windows Setup. In the Network field of the Change System Settings dialog box, choose the DEC Pathworks version 4.0 option. Windows 3.1 will install the DEC Pathworks network drivers included with Windows 3.1 and modify the appropriate entries in SYSTEM.INI.

Note

Windows Setup may display a message that says that a newer version of DEC Pathworks is available. Because DEC Pathworks 4.0 works with Windows 3.1, you can ignore this message.

Q: I see that Windows printer drivers for the following Digital printers are included in with DEC Pathworks 4.1:

- DEClaser 2100 (LN05)
- DEClaser 2200 (LN06)
- LA324
- LA70
- LJ250 and LJ252

I see also (previously in this section) that eight Windows printer drivers for Digital PostScript printers are included with Windows 3.1. However, I do not see Windows printer drivers available for the following Digital printers:

- LA75
- LN03
- LN03 PLUS
- DEClaser 1100 (LN07)
- DEClaser 3200 (LN08)

Do Windows printer drivers for these printers exist and, if

so, how can I get them?

A: Yes, they do exist. You can get them through DEC directly or through Digital's DECPCI CompuServe Forum (enter **GO DECPCI** at the prompt).

Note

PC Integration).

The DEC Pathworks CompuServe Forum is called DECPCI (as in DEC

IBM OS/2 LAN Server

IBM OS/2 LAN Server, which is also known as the IBM DOS LAN Requester, is based on Microsoft LAN Manager. Setup supports the following versions:

- LAN Server versions 1.x are equivalent to Microsoft LAN Manager 1.x. See the "Microsoft LAN Manager Networks" section later in this chapter.

However, IBM distributed CSD 5015 for LAN Server 1.3, which brings it up to the equivalent of LAN Manager 2.0.

- LAN Server version 2.0 is also treated as Microsoft LAN Manager 2.0 but also includes some LAN Server-specific components.

Running Windows with LAN Server version 2.x requires the files LANSRV.DRV, WINDLR.DLL, NETAPI.DLL, and PMSPL.DLL. All four files should be in your LAN Server directory.

Windows includes updated versions of the NETAPI.DLL and PMSPL.DLL files shipped with LAN Server. These files are installed automatically during Setup.

LAN Server versions below 2.0 do not allow you to use the IBM OS/2 LAN Server aliasing scheme from inside Windows applications. Also, LAN Server versions below 2.0 do not allow you to log on through Windows Control Panel. Doing so might cause your machine to hang. Always log on at the command prompt, either before starting Windows or while Windows is running.

IBM PC LAN Program

When installing for IBM PC LAN Program, Setup adds the following entry to the **[386enh]** section of SYSTEM.INI:

```
INDOSpolling=TRUE
```

The IBM PC LAN Program is based on Microsoft Network (MS-Net) and will be handled as such by Windows.

The IBM PCLP Extended Services refers to network drives and printers by two different names. Usually, when connecting to a network, you select connections from a list containing descriptive names, but internally connections are made using hidden names such as \\SERVER\IBMXS001. With PCLP Extended Services, you must type the hidden names in Control Panel or File Manager to make new network connections. The network administrator can supply the proper names to use.

Some versions of PCLP lock up your system if you receive a broadcast message while running Windows. You can disable these messages with the NET PAUSE MESSENGER command. Or you can start up your network with NET START RDR instead of NET START RCV or NET START MSG commands.

When you connect to a network printer in Control Panel, that connection will not be visible to non-Windows applications. It will, however, still be usable by Windows and Windows applications.

Invisible Software—NET/30 For Windows

To use NET/30 For Windows, choose the Custom Setup option when you run Setup. For your network configuration, choose Other (which requires a disk provided by manufacturer). You are prompted for a path to the directory containing your NET/30 files. Your SYSTEM.INI and WIN.INI files will automatically be updated.

If you are installing Windows on a nondedicated file server, and you are sharing a serial printer, you must add an entry to SYSTEM.INI. If you are sharing COM1, add **COM1AutoAssign=0** to the **[386enh]** section. If you are sharing COM2, add **COM2AutoAssign=0** to the **[386enh]** section.

Microsoft LAN Manager Networks

Many networks, such as IBM LAN Server, DEC Pathworks, and 3Com 3+Open are based upon Microsoft LAN Manager. Consult your network documentation, network distributor, or system administrator to learn whether your network falls into this category and, if so, on which version of LAN Manager it is based.

Network software based on MS-DOS LAN Manager Basic must not be loaded in the high memory area (HMA). The network administrator can determine if these conditions apply to a specific workstation.

If you are using the Ungermann-Bass XNS transport stack and Windows in 386 enhanced mode, you must make sure the transport stack is not using expanded memory. If your system is configured to provide expanded memory with a memory manager such as EMM386.EXE, you can disable the expanded memory option. Or, if you want to continue using expanded memory, you can disable its use by the Ungermann-Bass transport stack with the following steps.

To disable expanded memory for the Ungermann-Bass transport stack:

1. Open your `PROTOCOL.INI` file by using a text editor such as Notepad. Your `PROTOCOL.INI` file is in your LAN Manager directory.
2. In the section `[XNS_XIF]`, add a **noemm** entry, or, if the entry already exists, make sure that it is not commented out with a semicolon at the beginning of the line.
3. Save your `PROTOCOL.INI` file, then quit and restart Windows.

Your system might slow down considerably when you run Windows in 386 enhanced mode if your LAN Manager components are configured to use expanded memory. If this is a problem, turn off the use of expanded memory by modifying your `LANMAN.INI` and `PROTOCOL.INI` files. The exact procedure will vary depending on what components you are running. See the documentation for LAN Manager for further details.

To disable expanded memory for LAN Manager components:

1. Open your `LANMAN.INI` file by using a text editor such as Notepad. Your `LANMAN.INI` file is in your LAN Manager directory.
2. Add **lim=no** in the `[workstation]` section.
3. Save your `LANMAN.INI` file, and restart your computer.

Or you can stop your workstation and restart it again using the `NET STOP WORKSTATION` and `NET START WORKSTATION` commands. Also, you may want to configure other network components (such as protocol stacks) to avoid using expanded memory. Consult your network's documentation for the specific component for instructions on how to do this.

Some early copies of LAN Manager 1.x will require a maintenance upgrade to run with Windows. If you experience problems, contact your network vendor for an upgrade.

If you upgrade from an earlier version of LAN Manager Basic to version 2.1 Basic using the Over-the-Network Upgrade process, your `SYSTEM.INI` and `WIN.INI` files might be left with incorrect information. This will only happen if your Upgrade procedure has been configured to update Windows installations. This will cause you to receive a warning that “WinPopup” cannot be found, and all network functions in File Manager, Print Manager, and Control Panel will be unavailable.

To correct this problem, change the value of the **load=** entry in your `WIN.INI` file by removing the value **WinPopup** or **WinPopup.exe**. Then run Windows Setup from the command prompt while in your `WINDOWS` directory. Choose the Microsoft LAN Manager (version 2.1 Basic) option to specify the network.

LAN Manager Enhanced lets you use pop-up services to see incoming broadcast messages. These pop-up services can disrupt the Windows display, so you must either disable them or run the LAN Manager WinPopup utility so they can coexist with Windows.

The WinPopup utility should be in your LAN Manager `NETPROG` directory, included on your path. To automatically start the utility when you start Windows, you must include the entry **load=winpopup.exe** in the **[Windows]** section of `WIN.INI`. If you install Windows for LAN Manager 2.0 or 2.1 Enhanced, this procedure is taken care of automatically. If you are running LAN Manager 1.x Enhanced, you must insert this entry yourself.

Note Windows 3.1 includes updated versions of several LAN Manager files, including the WinPopup utility.

Alternatively, if you want to disable the pop-up services, use the following procedure.

To disable pop-up services:

1. In the `LANMAN.INI` file in your LAN Manager root directory, change the **wrkservices=** entry by removing the **netpopup** or **minipop** value.

If you remove the **netpopup** and **minipop** values but leave the **messenger** value, messages will still be received but will be recorded in the `MESSAGES.LOG` file in your LAN Manager

directory rather than being displayed on the screen.

If you do not wish to log your messages, you can also remove the **messenger** value from this same line.

2. Save the file, quit Windows, and restart your computer.

For Windows to support LAN Manager 2.0 Enhanced, you must have the files NETAPI.DLL and PMSPL.DLL. These files are in your LAN Manager NETPROG directory, which should be on your path. Windows also includes updated versions of these files that will be installed automatically on some older versions of LAN Manager.

For Windows to support LAN Manager 2.1 Enhanced, you must have the files NETAPI.DLL, PMSPL.DLL, LANMAN21.DRV, WINPOPUP.EXE, and LM21_W31.HLP. These files are usually in your LAN Manager NETPROG directory, which is on your path. If you are missing any of these files, you may receive warning messages when starting Windows or be unable to use Windows network functions.

Microsoft Network and Compatibles

If a network is present and detected, but cannot be identified during Setup, Microsoft Network (MS-Net) is the default network that will be set up.

The Microsoft Network driver does not support any vendor's name aliasing scheme.

The following notes apply to the general category of networks that support the MS-DOS network interface and NETBIOS protocols:

- Because of the way some of these networks handle print queues, Print Manager cannot distinguish multiple print queues on the same server. The lists of print jobs in these queues might be displayed improperly. Also, Print Manager might not be able to display the job title when displaying queue information.
- When you set up Windows for Microsoft Network, the following entries are added to the **[386enh]** section of SYSTEM.INI:

```
TimerCriticalSection=10000  
UniqueDOSPPSP=TRUE  
PSPIncrement=5
```

For some networks, you may be able to remove one or more of these entries to improve performance.

Novell NetWare

When you are running Novell NetWare, Windows Setup will copy the following files to your WINDOWS directory:

NETX.COM	IPXODI.COM	TBMI2.COM
IPX.OBJ	LSL.COM	

If you are running a shared copy of Windows from a network, these files are in the shared network directory.

Before running Windows, you should take the following steps.

To get ready to run Windows with Novell NetWare:

1. Replace your current NetWare shell with the NETX.COM provided.

Windows 3.1 requires that the NetWare shell components on your workstation (such as NET5.COM) be version 3.01e or higher. You can use these shell components even if your servers are running older versions of NetWare (as far back as NetWare 2.10).

Your current shell may be called by any of the following names:

NET3.COM	XMSNET3.COM	EMSNET3.COM
NET4.COM	XMSNET4.COM	EMSNET4.COM
NET5.COM	XMSNET5.COM	EMSNET5.COM
NETX.COM	XMSNETX.COM	EMSNETX.COM

NETX.COM will run on MS-DOS version 3.0 or higher.

2. If you are running Novell's IPXODI.COM and LSL.COM, you will need to upgrade these to the versions provided.
3. If you will be running Windows in standard mode, you should load the TBMI2.COM memory-resident utility when running Windows. Novell recommends that you create a batch file that will load this utility, then start Windows, then unload the utility when Windows exits. The batch file could be named RUNWIN.BAT and look like this:

```
tbmi2
win
tbmi2 /u
```

TBMI2 allows you to safely run applications that use the NetWare IPX and SPX functions under standard mode Windows or the MS-DOS 5.0 task switcher.

4. If you are running Novell's IPX.COM, the system administrator must build a new version using the IPX.OBJ provided.

The following notes also apply to Novell NetWare:

- If you have a Western Digital Ethercard Plus and have problems accessing drives using the `MAP ROOT` command, contact Western Digital for an updated driver.
- Do not try to log on, log out, attach, or detach a Novell server from the MS-DOS Prompt within Windows. You must perform these operations before starting Windows.
- By default, NetWare gives you access to only 40 files at a time. When you are running applications with Windows, you can exceed this limit rather quickly. If so, you might see unexpected error messages. To increase the file access limit, add the following line to your `SHELL.CFG` file:

```
file handles = 60
```

You should also make sure the following line is in your `CONFIG.SYS` file:

```
files = 60
```

Flowchart 4.4
Garbled Output
on Novell Network

- If you get unusable output when printing to a NetWare server (such as incorrect fonts, garbled text, invalid page breaks, or blank lines), you might need to edit your print job configuration. Use the NetWare `PRINTCON` utility to set the Auto Endcap and Enable Time-out options to No.
- If you are running Windows in 386 enhanced mode, paging to a drive on a NetWare 286 server might cause Windows to take up to a minute to start. For details about how to control the location of your paging file, see Chapter 14, "Optimizing Windows," in the *Windows User's Guide*.
- A NetWare file server does not include the directory entries dot (.) and double dot (..) as MS-DOS does. However, the 3.01 or higher NetWare shells can emulate these entries when applications attempt to list the files in a directory. If you have problems listing files or deleting directories, turning on the Show Dots feature will help. Add the following line to your `SHELL.CFG` file:

```
show dots = on
```

Turning on Show Dots will cause problems with earlier versions of some 286-based NetWare utilities, such as `BINDFIX.EXE` and `MAKEUSER.EXE`. Make sure you upgrade these

utilities if you upgrade your NetWare shell.

- Redirected drives might look different in Windows. For example, a device mapped as *FileServerName/Volume:Directory* will appear in Windows simply as *FileServerName/Volume:*, showing the root of the file server's shared volume, rather than the subdirectory you expected. If so, you can correct this discrepancy with the MAP ROOT entry, as explained in the following paragraph.
- In some cases Windows applications may change the default directory on a drive. This might upset your configuration if, for example, your path includes the current directory on a network drive (that is, your path includes a drive letter without a specific directory, such as Z: instead of Z:SYSTEM).

You can prevent this problem by using MAP.EXE and LOGIN.EXE versions 3.0 and later to set up fake roots, or choose the MAP ROOT function when mapping a connection in File Manager. This feature simulates the MS-DOS **subst** command, which sets the root of a given drive to a directory designated by the user instead of setting it to the true root of the volume.

For example, you might usually map drive F to the HOME\TERRI directory on the SERVER\SYS volume, and include drive F in your path. To do this, include the following command in your AUTOEXEC.BAT file or type the command before starting Windows:

```
map f:=count\sys:home\terri
```

The default directory on drive F will then be HOME\TERRI. To prevent Windows from changing this, replace the command above with this one:

```
map root f:=count\sys:home\terri
```

This command would make the directory HOME\TERRI appear to be the root of drive F.

- If you are running Windows in 386 enhanced mode, you can adjust the way Windows handles your network drive mappings by using options in the Network section of Control Panel. Usually, when you exit Windows, all of your drive mappings are restored to the way they were before you started Windows, and all changes you made inside Windows are lost. If you clear the Restore Drives option, the mappings you made inside

Windows will remain when you exit Windows.

- Usually, each virtual machine you start from Windows will have its own set of drive mappings. Changes you make in one virtual machine will not affect another. If you set the NW Share Handles option, drive mappings will instead be global, and changes made in one virtual machine will affect all other applications.

See the help available in the Network dialog box in Control Panel for more information on these options.

- When installing for Novell NetWare, Windows Setup should add the entry **load=nwpopup.exe** to the **[Windows]** section of your WIN.INI file. This entry automatically starts the NetWare pop-up utility, which displays your incoming broadcast messages. If this entry has not already been added, set **load=NWPopup** in your WIN.INI file.
- If you are using NetWare Lite, during Setup choose either “No Network Installed” or “Microsoft 100% LAN Compatible” in the System Settings dialog box. If you choose “Microsoft 100% LAN Compatible Network,” all NetWare Lite connections will appear with a full path in the File Manager and Control Panel. You cannot, however, assign new network drives through File Manager Control Panel.

For either network choice, you should make all drive and port assignments before starting Windows. These connections will then be accessible through File Manager, Print Manager, Control Panel, and applications.

If you install Windows on a NetWare Lite Network server, then you should set these parameters:

- Increase the number of client tasks in the NetWare Lite server configuration by 20 for each client and increase the **files=** setting in CONFIG.SYS by 20 for each client that will be connected to the server.
- Increase the **files=** setting in the CONFIG.SYS on the client machine.
- You may need to increase the MS-DOS SHARE.EXE parameters if you are trying to open many files (for example, when using

database applications).

- Set the read-only attribute for all .EXE, .COM, and .OVL files in the WINDOWS directory and SYSTEM subdirectory.
- Set **UniqueDOSPSP= true** in the **[386enh]** section of SYSTEM.INI.
- Do not use INT 2, INT 9, or above and do not use a base I/O port address below 300 for your LAN card (such as ARCnet or Token Ring) unless you use VPICDA.386, which you can obtain from either Microsoft or Novell.

TCS 10Net

Tiara Computer Systems 10Net (formerly known as DCA 10Net) versions 4.1 and above are compatible with Windows 3.1. Windows Setup treats these as Microsoft Network-compatible.

If you purchase 10Net for Windows, it will install additional Windows components that will enhance the functionality available in Windows File Manager, Control Panel, and Print Manager.

The following notes apply for TCS 10Net:

- You cannot use File Manager to format floppy disks when running versions of 10Net earlier than 5.0.
- When installing for TCS 10Net, Windows Setup adds the entry **TimerCriticalSection= 10000** to the **[386enh]** section of SYSTEM.INI. The **TimerCriticalSection=** value may be set lower on some versions of 10Net.

- When installing for TCS 10Net version 4.1x for use with the DCA 1 MB card, Windows Setup adds the following entries to the **[386enh]** section of SYSTEM.INI:

```
INDOSPolling=TRUE  
PSPIncrement=5  
TimerCriticalSection=10000  
UniqueDOSPPSP=TRUE
```

Ungermann-Bass Net/One

Make sure you choose the proper network option:

- Ungermann-Bass Net/One is based on Microsoft Network (MS-Net). Choose the Microsoft Network or 100% Compatible option when running Windows Setup.
- Ungermann-Bass Net/One LAN Manager is based on Microsoft LAN Manager. Choose the Microsoft LAN Manager option when running Windows Setup. Setup should correctly identify your network along with the proper version number.

If you are using an Ungermann-Bass network card with any network, including networks not produced by Ungermann-Bass, your system may crash randomly when running Windows in 386 enhanced mode unless you set the value

TimerCriticalSection=10000 in the **[386enh]** section of SYSTEM.INI.