

SoftWindows™ 95 for UNIX
Administrator's Guide
(Version 5 of SoftWindows 95)

Document Number 007-3221-006

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SoftWindows™ 95 for UNIX Administrator's Guide (Version 5 of SoftWindows 95)
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About This Guide

About this documentation

The documentation for SoftWindows for UNIX is provided in two guides:

- This *Administrator's Guide* describes how to install and set up SoftWindows, and configure it to take advantage of specific features of your UNIX installation. It is designed for use by advanced users, and assumes familiarity with UNIX.
- A separate *User's Guide* provides information about using SoftWindows on a UNIX workstation.
- An on-line version of these guides is available from the SoftWindows Help menu.

Administration Overview

The *SoftWindows 95 Administrator's Guide* consists of the following chapters. Click on the chapter title to go there.

- Chapter 1, "Introduction"—Gives an overview of the features provided in SoftWindows for UNIX.
- Chapter 2, "Installation requirements"—Lists the installation requirements for SoftWindows running on Silicon Graphics workstations.
- Chapter 3, "Installation"—Describes how to install SoftWindows from the installation CD-ROM and how to set up the default values for each user.
- Chapter 4, "Setting up SoftWindows"—Describes how to set up the SoftWindows emulation of a PC's memory, disk drives, display, and keyboard.

- Chapter 5, “Additional installation information”—Describes how to upgrade from a previous version or deinstall SoftWindows, and lists the files that are installed by the installation procedure.
- Chapter 6, “SoftWindows licensing”—Describes the FLEXlm licensing system and explains how to use the SoftWindows built-in licensing function to modify a license.
- Chapter 7, “SoftWindows configuration”—Lists the variables in the SoftWindows configuration file and the SoftWindows X resource file and explains how to modify their default values.
- Chapter 8, “Tuning the performance of SoftWindows”—Describes the factors affecting the performance of SoftWindows and explains how to configure them for maximum performance.
- Chapter 9, “Advanced installation options”—Gives additional information about installing and setting up SoftWindows for specific requirements and includes details of secure mode.
- Chapter 10, “Networking with SoftWindows”—Describes the networking features built into SoftWindows and gives information on setting up different network packages.
- Chapter 11, “Windows licensing and MS-DOS applications”—Describes how to use SoftWindows to administer licenses for MS-DOS and Windows applications.
- Chapter 12, “Reference”—Lists the environment variables and command-line options and describes the MS-DOS and UNIX utilities shipped with SoftWindows.
- Chapter 13, “Error messages”—Lists possible error messages, their cause, and recommended actions.

Conventions

For clarity, this guide uses the following conventions:

- Linked references to other sections in the book are colored blue.
- Steps in a procedure are numbered.

Abbreviations

This guide uses the following abbreviations:

Table i Abbreviations

This abbreviation	Refers to this
SoftWindows	SoftWindows 95 version 4 for UNIX workstations
Insignia	Insignia Solutions
MS-DOS	Microsoft Disk Operating System for the IBM PC
PC	An Intel-based computer
Windows	Microsoft Windows 95

Information Sources

Silicon Graphics provides a number of different sources of information about SoftWindows, including the following Web pages:

- SoftWindows 95 Usage Hints and Registration Information
`file:/usr/lib/SoftWindows/swin_hints.html`
- Swin95 Bulletin Page
`http://www.sgi.com/Products/SGIHelp_Hub/SoftWindows95.html`
- SoftWindows FAQ (Frequently Asked Questions)
`http://www.sgi.com/Technology/PC_Conn/faq`
- Silicon Surf
`http://www.sgi.com`

Microsoft information sources

For more information about setting up MS-DOS and Microsoft

Windows we recommend the following resources:

- CompuServe (GO MSWIN).
- Microsoft's FTP server (*ftp.microsoft.com*).
- Microsoft's Web server (*http://www.microsoft.com*).
- Microsoft Windows Resource Kit, which provides administrator-level Microsoft Windows-specific information.

Introduction

This chapter provides an overview of SoftWindows for UNIX, and describes the new features in SoftWindows 95.

SoftWindows: PC compatibility for UNIX workstations

SoftWindows is a complete IBM-compatible PC in software. It allows UNIX users to run Windows and MS-DOS applications on their workstations as if they were running on a PC.

It combines full PC compatibility with fast performance and built-in networking, so, for example, users can receive electronic mail, read PC-formatted CD-ROMs, and print PC files to a network printer, all from their UNIX workstation.

SoftWindows: a cross-platform solution

SoftWindows is available for the leading RISC-based UNIX workstations from Hewlett Packard, Sun/SPARC, IBM, Motorola, and Silicon Graphics, as well as Apple's Power Macintosh computers.

SoftWindows provides integrated access to information throughout an organization by letting PC and UNIX users share the same data and applications. From one workstation users can run native UNIX applications, Windows and MS-DOS applications, and also use PC-based networked systems.

SoftWindows allows users to standardize on today's most popular productivity applications, such as Microsoft Office and Lotus SmartSuite on PC, UNIX, and Macintosh platforms, throughout the organization.

New features in SoftWindows 95 Version 5

SoftWindows 95 Version 5 provides the following enhancements and extensions:

- Sound Blaster and MIDI support
- Optimized and Standard FPU emulation
- MMX support
- RDTSC support
- VESA 2.0 standard Super Video Graphics (SVGA) display emulation

Installation requirements

SoftWindows for UNIX is supplied on CD-ROM. This section specifies the hardware and software required to run the version of SoftWindows for SGI workstations.

System software

IRIX 6.5 or later.

Memory

For an Indy system, at least 48 Mbytes of physical memory is needed. The performance of SoftWindows will be improved with more memory. 64 Mbytes is recommended.

For an O2 system, you need at least 96 Mbytes, with 128 Mbytes recommended.

Note: For each additional Mbyte of PC memory one extra Mbyte of workstation RAM is recommended for best performance.

Disk space

The figures listed below are approximate, and should be used only as a rough guide.

Note: An additional 180 Mbytes is required for each user's Windows 95 hard disk file.

Table 2-1 Required Disk Space

	Full Installation	Upgrade Installation
Core package	15 Mbytes	30 Mbytes
Online help files	25 Mbytes	25 Mbytes
Windows setup files	90 Mbytes (Windows 95)	15 Mbytes (Windows 3.11)

Table 2-1 (continued) Required Disk Space

	Full Installation	Upgrade Installation
Cross-platform compatibility	8 Mbytes	8 Mbytes
Hard disk data file	150 Mbytes	30 Mbytes (Mandatory)
Maximum total (approximate)	290 Mbytes	110 Mbytes
Minimum total (approximate)	15 Mbytes	60 Mbytes

Swap space

The swap space should be at least three times the physical memory size or twice the physical memory size for systems with more than 48 Mbytes.

Floppy disk drives

The standard 3.5-inch Silicon Graphics compatible floppy disk drive is supported.

CD-ROM drive

To install SoftWindows you need a compatible CD-ROM drive connected to your workstation.

Keyboards

All Silicon Graphics, US, UK, French, and German keyboards are supported.

Network devices

Network devices supplied by Silicon Graphics are supported. No Token-Ring support is provided under Silicon Graphics due to limitations with the IRIX Token-Ring subsystem.

Installation

This chapter describes how to perform a full installation of SoftWindows from the two installation CD-ROMs, or upgrade from SoftWindows 4.0 using the upgrade CD-ROM.

Installing and Upgrading SoftWindows

To upgrade from SoftWindows 4.0 you will need network access to an existing SoftWindows 5.0 installation or CD-ROM.

To install SoftWindows you need an activation license, which can be one of the following:

Table 3-1 License Types

License	Description
Demonstration license	Allows any number of users to run SoftWindows for a limited time period.
Concurrent (full) license	Allows a specified number of users to run SoftWindows for an unlimited time period.
Nodelock	Allows any number of users to run SoftWindows on a specific host machine for an unlimited time period

To install a license you need to:

1. Install SoftWindows.
2. Find your license server FLEXlm HostID and server name; refer to “Hostids for FLEXlm-supported machines.”
3. Install your license.

This chapter describes each of these procedures in detail, and contains the following detailed sections:

- “Before you install”
- “Installing SoftWindows”
- “Upgrading from SoftWindows 4.0”
- “Licensing SoftWindows”
- “Setting up SoftWindows for each user”
- “Troubleshooting”

Additional information on installing and upgrading can also be found in the following chapters of this Admin guide:

- Chapter 2, “Installation requirements”—Lists the installation requirements for SoftWindows running on Silicon Graphics workstations.
- Chapter 5, “Additional installation information”—Describes how to upgrade from a previous version or reinstall SoftWindows, and lists the files that are installed by the installation procedure.
- Chapter 9, “Advanced installation options”—Gives additional information about installing and setting up SoftWindows for specific requirements and includes details of secure mode.

Before you install

Before installing SoftWindows, you need to have a suitable CD-ROM drive connected to your workstation. If necessary, refer to your system's documentation for information on how to do this.

To install SoftWindows a window manager such as Motif must be running on your workstation.

The installation process also requires:

- At least 23.5Mbytes of disk space to perform a full installation, (plus 180 Mbytes for each user's C: drive) or 70 Mbytes of disk space to perform an upgrade from SoftWindows 2.0. See Chapter 2, "Installation requirements," for more details of disk space requirements.
- For an Indy system, at least 48 Mbytes of physical memory. The performance of SoftWindows will be improved with more memory. 64 Mbytes are recommended.
For an O2 system, you need at least 96 Mbytes of memory, with 128 Mbytes recommended.

It is recommended that at least three times the physical memory be allocated to the swap space, or twice the physical memory size, for systems with more than 48 Mbytes.

Planning the installation

The optimum installation configuration depends on a number of factors including whether SoftWindows will be used in a single- or multi-user environment. Advantages and disadvantages of different installation options are discussed in Chapter 8, "Tuning the performance of SoftWindows."

Decide on the following before you install:

Hard disk data files

Installing the hard disk data file (*WIN95.DAT*) is optional, but the file is required whenever a user creates a new C: or D: drive.

A hard disk data file occupies approximately 150 Mbytes of disk space. In a multi-user environment, unless your network has no shortage of disk space you should consider providing access to the hard disk data file from a single central source. You can do this in a number of ways:

- Place the SoftWindows CD in a CD-ROM drive accessible across the UNIX network. When prompted, users should specify the path to the *WIN95.DAT* file in the directory on which the CD is mounted.
- Install the hard disk data file once on a network file server, accessible across the UNIX network. When prompted, users should specify the network path to the *sys.diskdata* file in the SoftWindows installation directory.
- Copy the *WIN95.DAT* file onto a network file server and create a symbolic link called *sys.diskdata* in each install directory pointing to the *WIN95.DAT* file. SoftWindows will be able to find the hard disk data file without prompting the user. See also “Creating Symbolic links to the hard disk data file.”

Microsoft Windows 95 setup files

Installing the Windows 95 setup files is optional, but the files are required whenever a user changes the Windows configuration. For example, when installing additional Windows drivers, a dialog box appears.

In a multi-user environment, unless your network has no shortage of disk space you should consider providing access to the Windows 95 setup files from a single central source. You can do this in a number of ways:

- Place the SoftWindows CD in a CD-ROM drive accessible across the UNIX network. Users should then set up an VFSA drive that points to the *win95* directory on the CD. When prompted to insert the disk labeled Windows 95 CD-ROM, users should choose the VFSA drive that points to the *win95* directory on the CD.
- Install the Windows 95 setup files once on a network file server accessible across the UNIX network. Users should then set up an VFSA drive that points to the *\$SWINHOME/win95* directory. When prompted to insert the disk labeled Windows 95 CD-to users should choose the VFSA drive that points to the *\$SWINHOME/win95* directory.
- Copy the *win95* directory from the SoftWindows CD onto a network file server. In each user's *\$SWINHOME* directory, create a symbolic link called *win95* pointing to the *win95* directory. Users should then set up an VFSA drive that points to the *\$SWINHOME/win95* directory. When prompted to insert the disk labeled Windows 95 CD-ROM, users should choose the VFSA drive that points to the *\$SWINHOME/win95* directory.

Cross-platform customization files

Consider whether you will need to install the cross-platform customization files. These are required in the following circumstances:

- If users will run SoftWindows from X terminals or workstations other than the default type associated with the platform you are installing on.
- If you perform an upgrade installation based on an existing SoftWindows 2.0 installation (as opposed to a SoftWindows 2.0 CD), and you install on a different platform from the one on which you installed SoftWindows 2.0 but wish to continue using the same keyboard as before.

Installing SoftWindows

Read the instructions that came with the installation CDs to install SoftWindows.

Upgrading from SoftWindows 4.0

You can upgrade your original SoftWindows 4.0 disk for use with SoftWindows 95. Note that once you have done this, you will be unable to use the disk with SoftWindows 4.0. For this reason you should copy the SoftWindows 4.0 hard disk file, upgrade it, and use it with SoftWindows 95. You will then be able to continue using the original hard disk file with SoftWindows 4.0.

Upgrading installs enhanced drivers for use with Windows, and does not install Windows 95. To do this you need to perform a full installation, or use a standard Windows 95 upgrade CD package available from most PC suppliers.

Use this procedure to perform a fresh upgrade, or to add components to an existing upgrade installation.

1. Copy the original hard disk to your home directory, and name it *WIN95-username.hdf*, where *username* is your UNIX login ID.
2. Check that the disk has at least 10 Mbytes of free space available. If necessary, increase its size first.
3. Run SoftWindows.

SoftWindows automatically upgrades the *WIN95-username.hdf* disk to include the latest Windows drivers.

Licensing SoftWindows

If SoftWindows has not yet been licensed, the SoftWindows license manager dialog box will be displayed towards the end of a full or upgrade installation:

This allows you to enter the licensing details for your copy of SoftWindows.

To license SoftWindows

To license SoftWindows:

1. Enter the data into the license manager dialog box as follows.

Note: You must enter the data exactly as shown on the license sheet:

Table 3-2 SoftWindows Licenses

Field	What you enter/select
Type Of License	Demonstration, concurrent, or nodelock.
Serial Number	A serial number in the form: 1234 1234 1234 1234 Note that you must enter the spaces. Alternatively, enter a demo code of the form 30-day , specifying the number of days.
Number Of Users (Concurrent license only)	The number of licenses purchased.
Expiry Date	The expiry date supplied in the form Day, Month, Year (for example 15, 12, 1996), or 1,1,0 for concurrent licenses.
Authorization Code	The 20-character authorization code; made up from the characters 0-9 and A-F (in upper case) with no spaces between the characters.

2. Choose Install License to install the license.

You can now set up each SoftWindows user, as described in the next section.

Setting up SoftWindows for each user

Once SoftWindows has been installed on the system you need to set up the environment for each SoftWindows user. SoftWindows includes a script to do this automatically; alternatively, you may prefer to set up the environment manually.

If you allow the environment to be set up automatically, the following files are altered: *.login*, *.profile*, *.Xdefaults*, *.ADwmrc*.

To set up SoftWindows manually

This section lists the environment variables you need to change if you want to set up SoftWindows manually.

To make the changes permanent, include the appropriate lines in the user's *.login* file if using the C shell or in the *.profile* file if using the Bourne or Korn shell.

LM_LICENSE_FILE

Unless a license has been installed on the user's machine, this needs to be set up to specify the location of the FLEXlm license server. It should be set to:

portnumber@servername

where *portnumber* refers to the TCP/IP port number of the license server. The default should be 744, as this is the number assigned to FLEXlm.

For example, if the server is called *myserve*, and FLEXlm is attached to port 744, then *LM_LICENSE_FILE* should be set up as follows:

For a C shell:

```
setenv LM_LICENSE_FILE 744@myserve
```

For a Bourne or Korn shell:

```
LM_LICENSE_FILE=744@myserve  
export LM_LICENSE_FILE
```

SWINHOME

This environment variable can be used to inform SoftWindows where it was installed. It is used by the SoftWindows executable when looking for various ancillary files. If you have the path set up correctly as shown above, then you do not need to set up *SWINHOME*.

To complete the installation

Depending on which window manager you are using, complete the installation process using the appropriate one of the following sections.

Once the installation is complete, log out and log in again as a user to make the changes to the system files take effect.

The user can now run SoftWindows; refer to “Running SoftWindows” in the *SoftWindows 95 for UNIX User’s Guide*.

Troubleshooting

SoftWindows environment not set

When starting SoftWindows after the initial run you may have problems reading man pages or accessing SoftWindows files.

This may be because on some X servers running *xdm* the *.profile* or *.login* file is not executed when you login, and therefore *\$SWINHOME* is not set. In this case you should:

1. Add the following lines to your *.xinitrc* file in your home directory, taking care to insert them before any code beginning *Xclients*:

```
if[ -f$HOME/.profile ]
then
cd $HOME
. .profile
fi
```

Note that *.xinitrc* is usually executed with a Korn shell rather than a C shell, and so the *.profile* file is used rather than the *.login* file.

If you do not have a *.xinitrc* file in your home directory, refer to the manual pages for the *xinit* command, and determine whether you can copy a default (or what should constitute a default) *.xinitrc* file to your home directory.

Note that you must insert the above lines of code into your *.xinitrc* file if you have had to create one.

2. Log out and log in again for the changes to take effect.

Bad or missing fonts

This error occurs whenever SoftWindows detects that none of the fonts required are available from the X server, or the fonts installed in the SoftWindows installation are not usable by the X server. To resolve this problem you need to configure the X server to use the relevant fonts in the SoftWindows installation. Use the command:

```
xset +fp $SWINHOME/fonts/SGI
xset fp rehash
```

where *\$SWINHOME* is the SoftWindows installation directory.

To make the change permanent, include these commands in the *.xinitrc* file in each user's home directory. If the *.xinitrc* file does not already exist, create it and insert these commands.

Alternatively, you can use a font not provided with SoftWindows using the following procedure. You might want to do this if you need extended ANSI characters, such as ß, , or accented characters, which are not included in the default font.

1. Select a suitable font name to use.

This can be done using a program such as *xlsfonts* or *xfontsel*.

Once a font is selected, the following line should be added to the SoftWindows 95 *app-defaults* file, found in *\$SWINHOME/SoftWindows*:

```
SoftWindows*fontlist: fontname
```

where *fontname* is the string you selected above.

2. Then restart SoftWindows.

Setting up SoftWindows

This chapter describes how to build a PC to the specification you want, using SoftWindows's emulation of a real PC's memory, disks, and display.

Softwindows setup

You set up SoftWindows emulation using the functions on the SoftWindows Options menu.

- Use Memory... to set up the amount of PC RAM you want to use.
- Use Disk Drives to specify how the PC hard disk drives are emulated on the workstation.
- Use Display... to choose SoftWindows emulation of the PC display adapter.

These functions are described in greater detail in these sections:

- "Restarting SoftWindows"
- "Setting up memory"
- "Setting up drives"
- "Setting up hard disk files"
- "Setting up VFSA drives"
- "Setting up floppy disk drives"
- "Setting up the CD-ROM"
- "Setting up the display"
- "Setting up audio devices"
- "Setting up keyboards"
- "MS-DOS configuration"

Restarting SoftWindows

After changing any of these preferences, which would correspond to a hardware change on a real PC, SoftWindows has to be restarted.

A dialog box is displayed to warn you and give you the option of canceling the change.

Note: If Windows 95 is running when you click *OK*, SoftWindows will shut down all Windows 95 applications. Windows 95 will then shut down cleanly before rebooting.

Setting up memory

SoftWindows allows you to set the main memory size to between 1 Mbyte and 255 Mbytes. The initial setting is 16 Mbytes, which is the minimum recommended value for running Windows 95.

The initial upper limit of the Memory dialog box is set to 32 Mbytes, but this can be set to any value up to 255 Mbytes; for more information refer to “System configuration file.”

Allocating more memory will improve the performance of Windows up to a certain point. However, allocating excessive memory may reduce the performance of your workstation and other UNIX programs.

If your application specifies that it needs expanded memory, also referred to as LIM or EMS (Lotus, Intel, Microsoft Expanded Memory Specification), you can allocate some of the memory to expanded memory using the EMM386 expanded memory emulator. For example, to use 2 Kbytes of extended memory as expanded memory include this line in the *CONFIG.SYS* file:

```
DEVICE=EMM386.EXE 2048
```

However, it is recommended that you use extended memory in preference to expanded memory wherever possible.

To specify the PC memory

1. Choose Memory... from the Options menu.
A dialog box shows the amount of memory and allows you to change it.
2. Select the amount of memory by dragging the slider until the value you want is shown above the slider.
3. Choose OK to restart SoftWindows with the memory configuration you have selected.

Setting up drives

PCs identify the different types of disk drives using the drive letters *A:* to *Z:*.

The following table shows the significance of the different drive letters and how they are set up when you first install SoftWindows.

You use the Open Drive... function on the Disk Drives cascade menu on the Options menu to set up and modify the floppy disk drives *A:* and *B:*; the hard disk drives *C:* and *D:*; the VFSA drives *E:* to *Z:*; and the CD-ROM drive (initially set to the first available VFSA drive for full installations, or *F:* for upgrade installations).

Table 4-1 Drive Descriptions

Drive	Default	Description
<i>A:</i>	Empty	The floppy disk drive.
<i>B:</i>	Empty	Additional floppy disk drive.
<i>C:</i>	<i>\$HOME/WIN95-user.hdf</i>	The user's startup, or boot, hard disk drive, where <i>user</i> is the user's UNIX login ID.
<i>D:</i>	Empty	Additional hard disk drive.
<i>E:</i>	<i>\$HOME</i>	Your UNIX home directory.
<i>G:</i>	<i>\$SWINHOME/windows</i>	Windows 3.1.1 shared Installation files. (Upgrade installations only).
<i>G:</i>	<i>\$SWINHOME/win95</i>	Windows 95 setup files, if selected during installation. (Full installations only).
<i>H:</i>	<i>\$HOME</i>	Your UNIX home directory

Setting up hard disk files

SoftWindows emulates PC hard disks using single files in the UNIX file system (normally system with a *.hdf* extension). The individual PC files within SoftWindows hard disk files are accessible only from within SoftWindows and cannot be listed using UNIX commands.

SoftWindows hard disk files can be attached to and detached from either of the PC drives *C:* and *D:* without affecting the information stored within the hard disk file.

SoftWindows will always use drive *C:* to start up unless a floppy disk is in an attached *A:* disk drive. You must therefore always have a bootable SoftWindows hard disk file attached to drive *C:*. This must include the Windows start-up files which are installed when the hard disk file is created.

To create a new empty *D:* drive

1. Ensure that you have enough hard disk space for the file you are creating. You can use the UNIX *df* command to check this. You must have at least 180 Mbytes of free disk space available.
2. Choose *New Drive...* from the *Disk Drives* cascade menu on the *Options* menu. A dialog box appears.
3. Enter a name for the new hard disk file. It is recommended you give this a *.hdf* extension.
4. Choose the size by dragging the slider until the size you want is shown above the slider.
5. Click *Empty hard disk*.
6. Choose *OK* to create the hard disk file you have specified.

SoftWindows will then be restarted with the new hard disk file set up as drive *D:*.

To create a new C: drive

1. If the option to install the hard disk data file was not selected during a full installation ensure that the contents of CD2 are available on a local or network drive.

Note: If you have performed an upgrade installation, Windows 3.11 will be installed instead of Windows 95.

2. Follow the procedure for creating a new *D:* drive (refer to "To create a new empty *D:* drive") but click Windows 95 installed instead of Empty hard disk in the New Hard Disk dialog box.

If SoftWindows cannot locate the Hard Disk data file (for example, if an option was not selected during a full installation) a dialog box appears.

3. Enter the path to the data file *WIN95.DAT* (on the second installation disk CD2) in the Data File... field.

For example, if CD2 is mounted in the */CDROM* directory, enter */CDROM/WIN95.DAT*.

4. Alternatively, click Data File... to display a dialog box.
5. Locate the *WIN95.DAT* file, click *OK* to return to the previous dialog box, then click *OK* to continue.
6. When the *D:* drive has been created choose Open Drive... from the Disk Drives cascade menu on the Options menu.
7. Remove the Hard Disk Drive *C:* File Name... entry and replace it with the name of your new *C:* drive.
8. Remove the Hard Disk Drive *D:* File Name... entry.

To choose the hard disk file for C: or D:

1. Choose Open Drive... from the Disk Drives cascade menu on the Options menu.

A dialog box shows the hard disk files assigned to drives C: and D:.

2. Type the name you require in the Hard Disk Drive C: File Name... or Hard Disk Drive D: File Name... text box.

3. Alternatively, click Hard Disk Drive C: File Name... or Hard Disk Drive D: File Name... to change the hard disk file used for drive C: or D:, respectively.

A dialog box lets you select the hard disk file to use.

4. Select the name of the file you want to use and choose OK to restart SoftWindows with the drive configuration you have specified.

If you select a SoftWindows 2.0 hard disk file, SoftWindows will upgrade it. A dialog box allows you to confirm that you wish to continue.

5. Choose Continue to upgrade the disk for use with SoftWindows 95, or choose Exit to cancel the operation.

Note: Once you have upgraded a SoftWindows 2.0 hard disk file, you will be unable to use the disk with SoftWindows 2.0. If you want to continue to use the original hard disk file with SoftWindows 2.0, you should copy the file and upgrade the copy. You will then be able to continue using the original hard disk file with SoftWindows 2.0, and the copied file with SoftWindows 95.

To remove the hard disk file from D:

1. Choose Open Drive... from the Disk Drives cascade menu on the Options menu to show the hard disk files attached to C: and D:.
2. Delete the name of the hard disk file in the Hard Disk Drive D: File Name... text box.
3. Choose OK to restart SoftWindows with the drive configuration you have specified.
4. To permanently remove the hard disk file for D:, use the UNIX *rm* command.

To increase the size of a hard disk file

The following instructions explain how to increase the size of an existing hard disk file.

Note: You must have sufficient space on your UNIX file system for this to work. These instructions assume you are running as a user with write permission to the directory containing the hard disk file.

1. Start SoftWindows in the usual way. For example, type the following command at the UNIX prompt:
`softWindows95`
2. Choose Modify Drive from the Disk Drives cascade menu on the Options menu. A dialog box lets you modify a hard disk file.
3. Type the name of the hard disk file in the Disk File... text box or click Disk File... A dialog box lets you select the hard disk file to modify.
4. Locate the file you want to modify and choose OK to return to the Modify Hard Disk dialog box.
5. Use the slider bar in the Modify Hard Disk dialog box to set the new size for the hard disk file.
6. Choose OK to modify the hard disk file.

SoftWindows saves a backup copy of the original hard disk file using the prefix *old*. For example, a hard disk file named *WIN95-user1.hdf* would be saved as *old.WIN95-user1.hdf*.

Once you have successfully increased the size of the hard disk file, you may wish to remove the backup copy of the modified file.

Setting up VFSA drives

SoftWindows allows you to share files between Windows/MS-DOS and UNIX by setting up selected UNIX directories as PC drives. The drives are set up using the Virtual File Sharing Architecture, and are referred to as VFSA drives.

Setting up a new VFSA drive

1. Use the right mouse button to click *My Computer* in Windows 95, then choose Map Network Drive from the popup menu.

A dialog box is displayed:

2. Select the drive you want to map to in the Drive field.
3. Enter the path to the network drive in the Path field, using the following format:

`\\VFSA\hostpath`

where *hostpath* is the full path to the UNIX directory. For example, `\\VFSA\users/fred` sets up an VFSA drive pointing to the `/users/fred` directory.

Drive letters

The number of drives available is determined by the value of *LASTDRIVE* in the *CONFIG.SYS* file. The default setting, *LASTDRIVE=Z*, makes drives up to Z: available.

To view the UNIX directories set up as VFSA drives

1. Choose Open Drive... from the Disk Drives cascade menu on the Options menu.

The Open Disk Drives dialog box shows the UNIX directory assigned to the first available VFSA drive.

2. Click the up-arrow or down-arrow to step through the currently available VFSA drives.

In each case the text box shows the directory assigned to the selected drive.

To change the UNIX directory assigned to an VFSA drive

1. Click the up-arrow or down-arrow to select the VFSA drive you want to change.
2. Type the directory you want to use into the text box, or click Directory Name...
A dialog box allows you to select the UNIX directory to use as the VFSA drive.
3. Locate the directory you want to use and choose OK.
4. Choose OK to exit from the Open Disk Drives dialog box with the drive configuration you have specified.

Mapping filenames on an VFSA drive

Windows 95 filenames are not case sensitive, so upper and lower case letters are treated as equivalent. To enable Windows 95 to distinguish between files whose UNIX names differ only in case (for example, *fred.txt* and *FRED.TXT*), you select a preferred case for each VFSA drive you set up. SoftWindows preserves file names that are in the preferred case, but maps all other files to a unique filename.

The preferred case must be one of lower, upper, or insensitive.

To choose a preferred case for an VFSA drive

1. View the directory set up as an VFSA drive in the Open Disk Drives dialog box.
2. Select the required option from the Host File Names Are: pop-up menu.

The options are shown in the following table:

Table 4-2 Windows95 VFSA Drive Options

Option	Description
Lower Case	Default setting. All new lower case file names are preserved on VFSA drives. Upper and mixed-case file names are mapped.
Upper Case	All new upper case file names are preserved on VFSA drives. Lower and mixed-case file names are mapped.
Case Insensitive	File name case is irrelevant.

Note: Case Insensitive is intended for use when assigning case-insensitive drives (such as Windows drives on PCs connected to the network) to an VFSA drive. Do not use this option for UNIX drives.

See “Using PC files stored in UNIX” in the *SoftWindows 95 for UNIX User’s Guide* for more information on filename mapping.

To remove a UNIX directory from a drive

1. Use the right mouse button to click My Computer in Windows 95, then choose Disconnect Network Drive from the popup menu.
A dialog box is displayed.
2. Click the VFSA drive you want to remove.
3. Choose *OK* to disconnect the VFSA drive.

To set up UNIX directories as VFSA drives in Windows 3.11 and MS-DOS

Type the following command at the C:\> prompt:

```
INSIGNIA\ -DOS utilities:T USE (MS-DOS utility)NET USE X: dir
```

where *X*: is the letter of the PC drive you want to assign to the UNIX directory, and *dir* is the full UNIX pathname of the directory (using / characters as separators).

For example, to assign *J*: to the directory *dos* in your home UNIX directory, give the command:

```
INSIGNIA\NET USE J: $HOME/dos
```

The drive can be any letter from *E*: to *Z*: (subject to the setting of *LASTDRIVE*), drives *A*: to *D*: being predefined by MS-DOS. The *CONFIG.SYS* file on the hard disk supplied with SoftWindows sets *LASTDRIVE* to *K*.

When the *NET USE* command is used to configure an VFSA drive, the new configuration is immediately reflected in the Open Disk Drives dialog box, and will be saved permanently if the configuration is saved upon exiting from SoftWindows.

If you set up a hard disk with more than one MS-DOS FAT partition, and assign the first partition as drive *D:*, MS-DOS will use drive *E:* for the second partition, drive *F:* for the third, and so on. In this case you need to use subsequent letters for any VFSA drives you set up.

Once an VFSA drive is configured in this way you can modify it in the Open Drives dialog box. The configuration is stored in your configuration file when you exit from SoftWindows, and the VFSA drives will be set up automatically each time you run SoftWindows.

To remove a UNIX directory from a drive in Windows 3.11 and MS-DOS

Type the following command at the C:\> prompt:

```
INSIGNIA\NET USE X: /D
```

where X: is the letter of the PC drive you want to remove.

To list the UNIX directories attached to drives in Windows 3.11 and MS-DOS

Type the following command at the C:\> prompt:

```
INSIGNIA\NET USE
```

This will list the PC drive letter of each VFSA drive, and the pathname of the directory to which it has been attached. If the command is given with a drive letter, it will show the current selection for that drive.

The not sharing message indicates that the drive does not support MS-DOS file sharing and locking because the underlying UNIX file system does not support it.

To specify the filename mapping in Windows 3.11 and MS-DOS

PC filenames are not case sensitive, so upper and lower case letters are treated as equivalent. You can choose how files are saved to VFSA drives.

Select the required option from the Host File Names Are: pop-up menu.

The options are shown in the following table:

Table 4-3 3.11 and MS-DOS VFSA Drive Options

Option	Description
Lowercase	Default setting. All new files are saved on VFSA drives in lowercase.
Uppercase	All new files are saved on VFSA drives in uppercase.
Case	All new files are saved on VFSA
Insensitive	drives in lowercase, and files on PC SCSI disks attached to the workstation can be assessed.

Setting up floppy disk drives

You can set up SoftWindows to use the internal or external 3.5-inch floppy disk drives on your workstation as the PC drives *A:* and/or *B:* to work with PC format 3.5-inch floppy disks.

To set up the floppy disk drives *A:* and *B:*

1. Choose Open Drive... from the Disk Drives cascade menu on the Options menu.
The dialog box shows the devices assigned to the floppy disk drives *A:* and *B:*.
2. Type the floppy disk drive device name into the appropriate text box labeled Floppy Drive *A:* Device File Name or Floppy Drive *B:* Device File Name.
The table opposite shows the floppy disk drive device names to use.
3. Choose OK to reset SoftWindows with the drive configuration you have specified.

Note: Assign each physical drive to only one SoftWindows drive letter (for example, *A:*). Assigning the same physical drive to multiple drive letters can cause access problems.

To deassign a floppy disk drive

Delete the device name from the text box labeled Floppy Drive A: Device File Name or Floppy Drive B: Device File Name, as appropriate.

The following are examples:

- Indy:
`/dev/rdisk/fds0d2.3.5hi`
- O2:
`/dev/rdisk/fds1d6.3.5hi`

Setting up the CD-ROM

Full SoftWindows 95 installations include a 32-bit CD-ROM driver for use with Windows 95. For this reason you only need to use the Microsoft CD-ROM Extensions (MSCDEX) in MS-DOS and Windows 3.11. For upgrade installations you should continue to use *MSCDEX*.

To set up the CD-ROM drive

1. Choose Open Drive... from the Disk Drives cascade menu on the Options menu.
The Open Disk Drives dialog box shows the device assigned to the CD-ROM drive.
2. Type the CD-ROM drive device name into the CD-ROM Device File Name text box.

The most common device name is `/dev/rdisk/dks0d4vol`.

Ensure that the CD-ROM is *not* mounted in UNIX.

Note that all users should have read access to the CD-ROM device. If necessary type:

```
chmod +r device
```

To use the CD-ROM with SoftWindows refer to the *SoftWindows 95 for UNIX User's Guide*.

Setting up the CD-ROM for use in Windows 3.11 and MS-DOS

Before you can use the CD-ROM drive in Windows 3.11 and MS-DOS, ensure that CDROM.SYS has been loaded from the CONFIG.SYS file (the command is commented out by default). The USECD command executes the following command to assign the CD-ROM to drive F:

```
CDEX (MS-DOS utility)MSCDEX /D:CDROM$$$ /L:F
```

You can include this line in your AUTOEXEC.BAT file if you want to be able to use CD-ROMs in Windows 3.11 and MS-DOS each time you run SoftWindows.

MSCDEX options

The MSCDEX command can accept the following parameters:

Table 4-4 MSCDEX Command Parameters

Parameter	Function
/D: device	Specifies the device driver to be used. For SoftWindows this is CDROM\$\$\$.
/M: buffers	Sets the number of buffers. This should be at least 5, but a larger value (such as 20) will improve performance.
/E:	Uses expanded memory if it is installed and available.
/V:	Displays additional information about memory usage during initialization.
/L: drive	Assigns the drive to the specified drive letter rather than the next available.

Setting up the display

SoftWindows 95 provides accelerated Windows display adapters optimized for Windows 95 and Windows 3.11 that take advantage of the host's X11 display server capabilities wherever possible. Under Windows 95, SoftWindows' display adapter also fully supports Microsoft's DirectX technology.

When Microsoft Windows is not running (that is, when the Windows desktop is not displayed, such as during Windows boot-up or while MS-DOS applications are running), SoftWindows provides emulation of a standard Super VGA display adapter.

To specify the number of colors for Windows

1. Click the Windows 95 *Start* button, then choose Control Panel from the Settings menu.
2. Double-click the Display icon in the Control Panel to open the Display dialog box.
3. Choose the Settings tab to show the current display settings.
4. Select 16 or 256 in the Color palette field.
5. Choose *OK* to reset SoftWindows with the display settings you have chosen.

Selecting 16 leaves more colors free for use by your other applications.

Note: With 256 colors selected you may experience color flashing when moving between SoftWindows and UNIX due to palette limitations.

To specify when to resize the Windows desktop

1. Choose Display... from the Options menu
A dialog box shows the display settings currently selected.
The Colors block displays the number of colors currently displayed, and is for information only.
2. Select Never if you do not want to be prompted to resize the Windows desktop.
3. Select Next to be prompted once, the next time you run Windows; the option will automatically change to Never once you have resized the desktop.

4. Select Always if you want to be prompted to resize the Windows desktop each time you run Windows.
5. Choose OK to reset SoftWindows with the display settings you have chosen.

To disable automatic resizing

The Resize Policy: pop-up menu allows you to disable resizing, or make resizing prompt you to restart SoftWindows.

The options are explained in the following table:

Table 4-5 Resizing Options

Option	Description
Smart	The default setting. The Windows desktop is automatically resized if you resize the SoftWindows window, provided Smartcopy is running.
None	Disables the ability to resize the SoftWindows window.
Restart	Prompts you to restart SoftWindows if you resize the SoftWindows window. This option is for use with Windows 3.11.

SoftWindows if you resize the SoftWindows window. This option is for use with Windows 3.11.

Changing the display memory allocation

SoftWindows 95 emulates a VESA 2.0 standard Super Video Graphics Array (SVGA) display, which provides a resolution of 640 x 480 or 640 x 400 with 256 colors, or 800 x 600 or 1024 x 768 with 16 colors. By default, SoftWindows 95 uses 1024 KB of memory for the display. To change the display memory allocation:

1. Choose Memory from the Options menu to open the Memory panel.
2. Click the button next to 512, 1024 (the default), 2048, or 4096.

After clicking OK, you will need to restart SoftWindows, and a dialog box is displayed to allow you to proceed or cancel the function.

Setting up audio devices

SoftWindows uses the host workstation's audio capabilities to emulate WAVE audio devices under Windows 95 and Windows 3.11. This enables you to make full use of Microsoft's WAVE audio APIs and DirectSound technology when running Windows applications. For example, you can record and play .WAV files, and use Windows 95 sound schemes. You can also record and play MIDI files.

SoftWindows does not emulate audio devices for MS-DOS based applications, even when they are run from an MS-DOS prompt within Windows.

By default, SoftWindows uses the audio ports selected in the Audio Control Panel on the host workstation. You can override the default ports by setting environment variables.

To configure a SoftWindows audio port

1. Set the appropriate environment variable to the value TRUE to enable an audio port.
2. Set the appropriate environment variable to the value FALSE or unset it to disable an audio port.

To disable an audio port, you need to use the Audio Control Panel on the host workstation.

By default, SoftWindows uses the audio ports selected in the Audio Control Panel on the host workstation. You can override the default ports by setting environment variables.

To configure a SoftWindows audio port

1. Set the appropriate environment variable to the value TRUE to enable an audio port.
2. Set the appropriate environmental variable to the value FALSE or unset it to disable an audio port.

You may need to ensure that only one input and output port is enabled at any time. See your workstation documentation for information on using audio ports simultaneously.

Configuring audio playback sound volumes

For information on enabling and muting playback sound, and ignoring Windows volume settings, see "Using SoftWindows" in the *SoftWindows 95 for UNIX User's Guide*.

Setting up keyboards

When you install SoftWindows the installation procedure automatically sets up SoftWindows, Windows, and MS-DOS for the keyboard type you specify. You will only need to change the configuration if you are changing the type of keyboard you are using or want to use the same copy of SoftWindows on workstations with different keyboards.

Some applications, such as Windows, look at the PC hardware directly rather than at the MS-DOS settings and will ignore the keyboard assignment.

To configure SoftWindows for a different keyboard

1. Add the appropriate *KEYB* command, as shown in the table below, to the *AUTOEXEC.BAT* file.

For French and German keyboard types it is recommended that you also set up SoftWindows to use codepage 850 so that all the characters on these keyboards are displayed correctly. Refer to the *Microsoft MS-DOS User's Guide and Reference* (not supplied) for details.

2. Choose Keyboard... from the Options menu. A dialog box appears.
3. Select the appropriate keyboard mapping file, as shown in the table below.
The UNIX keyboard mapping files are provided in *\$SWINHOME/keyboard*.

To use an international keyboard for Windows 95

1. Click Start, then click Settings and Control Panel.
2. Double-click the Keyboard icon in the Control Panel folder. The Keyboard Properties dialog box is displayed.
3. Click the Language tab to display the Language panel.
4. Click Add..., select the combination of language and host keyboard type that you want to use from the drop-down list box, and click OK.
5. Click Set as Default to choose it as the default language.
6. Click OK.

Table 4-6 International Keyboard Mappings

Keyboard type file	KEYB command	Keyboard mapping
SGI FR	<i>KEYB FR,850,C:\DOS\KEYBOARD.SYS</i>	SG.kbd
SGI GR	<i>KEYB GR,850,C:\DOS\KEYBOARD.SYS</i>	SG.kbd
SGI UK	<i>KEYB UK,850,C:\DOS\KEYBOARD.SYS</i>	SG.kbd
SGI US	–	SG.kbd
SGI FR INDY	<i>KEYB FR,850,C:\DOS\KEYBOARD.SYS</i>	SGINDYfr.kbd
SGI GR INDY	<i>KEYB GR,850,C:\DOS\KEYBOARD.SYS</i>	SGINDYgr.kbd
SGI UK INDY	<i>KEYB UK,850,C:\DOS\KEYBOARD.SYS</i>	SGINDYuk.kbd
SGI US INDY	–	SGINDYus.kbd

MS-DOS configuration

The *AUTOEXEC.BAT* and *CONFIG.SYS* files determine the configuration of MS-DOS in SoftWindows.

AUTOEXEC.BAT

The following listing shows the Windows 95 *AUTOEXEC.BAT* file:

```
@echo off
rem
rem     AUTOEXEC.BAT
rem     Copyright 1997 Insignia Solutions PLC. All rights reserved.
rem
path C:\INSIGNIA;%path%;C:\
set TEMP=C:\WINDOWS\TEMP
c:\insignia\VFSAdrive
rem
*****
rem ** Uncomment the following line to enable MS-DOS mouse support. **
rem c:\insignia\mouse.comVFSAdrive
rem *****
rem
*****
rem ** Uncomment the following line to enable DOS application
licencing. **
rem C:\INSIGNIA\DOSLIC.EXE
rem *****
mode com1:9600,n,8,1
prompt $p$g
ver
nlsfunc
mode con cp prep=((437 850) c:\windows\command\ega.cpi)
KEYB US,437,C:\WINDOWS\COMMAND\KEYBOARD.SYS
chcp 437
```


The following listing shows the Windows 3.1 *AUTOEXEC.BAT* file :

```
@echo off
rem
rem     AUTOEXEC.BAT
rem     Copyright 1996 Insignia Solutions PLC. All rights reserved.
rem
path C:\windows;c:\insignia;c:\dos
path %path%;c:\novell
path %path%;c:\nwclient;c:\
path %path%;c:\windows\iexplore\mail
set TEMP=C:\DOS
c:\insignia\VFSAdrive
c:\insignia\mouse.com
mode com1:9600,n,8,1
prompt $p$g
ver
```

CONFIG.SYS

The following listing shows the *CONFIG.SYS* file for Windows 95:

```
rem
rem     CONFIG.SYS
rem     Copyright 1997 Insignia Solutions PLC. All rights reserved.
rem
FILES=30
BUFFERS=30
device=c:\insignia\host.sys
rem
*****
rem  **  Uncomment the following line to enable MS-DOS CD_ROM
support.  **
rem  device=c:\insignia\cdrom.sys
rem
*****
lastdrive=z
STACKS=9,256
country=001,,c:\windows\command\country.sys
device=c:\windows\command\display.sys con=(ega,437,2)
```

The following listing shows the CONFIG.SYS file for Windows 3.1:

```
CONFIG.SYS
rem
rem      CONFIG.SYS
rem      Copyright 1996 Insignia Solutions PLC. All rights reserved.
rem
FILES=30
BUFFERS=30
device=c:\dos\himem.sys /TESTMEM:OFF
device=c:\insignia\host.sys
device=c:\insignia\cdrom.sys
device=c:\dos\setver.exe
lastdrive=z
STACKS=9,256
```

Additional installation information

This chapter explains how to upgrade a SoftWindows 2.0 hard disk file, how to install Windows 95 on a Windows 3.11 hard disk file, and lists the files installed by the installation process.

Upgrading a SoftWindows 2.0 hard disk file

Following a full or upgrade installation you can upgrade a SoftWindows 2.0 disk for use with SoftWindows 95.

Upgrading a SoftWindows 2.0 disk installs enhanced drivers for use with Windows 3.11, and does not install Windows 95. To do this you need to perform a full installation (see page 14), or use a standard Windows 95 upgrade CD package available from most PC suppliers (see “Upgrading Windows 3.11 to Windows 95”).

Note: Once you have upgraded a SoftWindows 2.0 hard disk file, you will be unable to use it with SoftWindows 2.0. For this reason you should copy the SoftWindows 2.0 hard disk file and choose this as your C: drive in SoftWindows 95, as explained below. You will then be able to continue using the original hard disk file with SoftWindows 2.0.

To upgrade a SoftWindows 2.0 disk after a full installation

1. Check that the disk has at least 5 Mbytes of free space available. If necessary, increase the free space first.
2. Copy the disk to your home directory. This enables you to continue using the original disk in SoftWindows 2.0.
3. Use the UNIX `cp -p` command to copy the windows directory from your SoftWindows 2.0 installation directory to your SoftWindows 95 full installation directory. This ensures that you can continue to use the applications installed on the disk.
4. Run SoftWindows (see "Running SoftWindows for the first time" in the *SoftWindows 95 for UNIX User's Guide*).
5. Choose the copy of the SoftWindows 2.0 hard disk file as your C: drive. For instructions, see "To choose the hard disk file for C: or D:."

SoftWindows automatically upgrades the hard disk file to include the latest Windows 3.11 drivers.

Note: In order to run Windows you must set up the G: drive to point to the copied windows directory. See "Setting up VFSA drives."

To upgrade a SoftWindows 2.0 disk after an upgrade installation

1. Check that the disk has at least 5 Mbytes of free space available. If necessary, increase the free space first.
2. Copy the disk to your home directory. This enables you to continue using the original disk in SoftWindows 2.0.
3. Run SoftWindows (see "Running SoftWindows for the first time" in the *SoftWindows 95 for UNIX User's Guide*).
4. Choose the copy of the SoftWindows 2.0 hard disk file as your C: drive. For instructions, see "To choose the hard disk file for C: or D:."

SoftWindows automatically upgrades the hard disk file to include the latest Windows 3.11 drivers.

Upgrading Windows 3.11 to Windows 95

If you have upgraded from SoftWindows 2.0 and want to take advantage of the additional features in Windows 95 you can upgrade a SoftWindows 2.0 hard disk file containing Windows 3.11 using a standard Windows 95 upgrade CD package, which is available from most PC suppliers.

A copy of the Windows 95 upgrade is supplied with the SoftWindows CD in the \WIN95 directory.

Ensure that your hard disk is at least 160 Mbytes before you upgrade to Windows 95; refer to "To increase the size of a hard disk file."

We recommend that you make a backup of your hard disk file before following this procedure.

Start the installation

1. Start SoftWindows with the C: drive you want to upgrade attached.
2. Insert the CD into your CD-ROM drive.
3. Start Windows 3.11.
4. Choose Run from the Program Manager File menu and type **F:\WIN95\SETUP**.

Running the Setup program

The Windows 95 Setup program will then run.

1. When the Software License Agreement is displayed click *Yes* to proceed.
You will then be given the opportunity to exit from other Windows applications.
2. Click *OK* to continue.

The Windows 95 Setup program will now ask you to make a number of choices, to allow you to specify how you want to configure Windows 95, and which components you want to install.

3. Select the configuration and components you require, and complete the dialog box as requested.

The Windows 95 Setup program then copies the files for Windows 95. This will take several minutes.

If an error message appears stating that Windows 95 was unable to copy a file, click the details button and check the name of the file. If the file is one of *dblSPACE.bat*, *defrag.bat*, *drvSPACE.bat* or *scandisk.bat*, skip the files and continue running the Setup program.

4. If asked to enter a CD key id, click *Next*, then click *Ignore*.

Windows 95 will then restart.

If you wish to use the mouse within SoftWindows beyond this point, you will need to attach the mouse:

5. Choose *Attach Mouse* from the *Actions* menu.

Once the Windows 95 installation is complete and the disk upgrader has been invoked SoftWindows will attach the mouse automatically.

The Windows 95 Setup program then sets up the components of Windows 95.

Set up Microsoft Exchange

A dialog box may then prompt you to set up Microsoft Exchange. Follow the screens to install the Microsoft Exchange options you require.

Complete the installation

Finally a dialog box confirms that installation has been successful. Click *OK* to restart with Windows 95. The installation is now complete.

Windows configuration

The first time you run SoftWindows after upgrading to Windows 95, the disk upgrade mechanism will start automatically. This optimizes Windows 95 for use with SoftWindows.

A Windows 95 configuration program will then run. One further reboot of Windows 95 will then occur to complete the process.

When Windows 95 starts you are asked to enter a Windows password:

1. Enter your name.
2. Press T and enter a password, or leave the Password field blank.
3. Press <Enter> to continue.

Note: When you subsequently run SoftWindows, the TurboStart feature enables Windows 95 to load instantly, and allows you to continue work in the applications you were previously using.

Deinstalling SoftWindows

To remove SoftWindows

Use Software Manager to remove SoftWindows. Choose System > Software Manager from the Toolchest. Follow the instructions in the Software Manager Help to remove the software.

To remove the licensing daemon

If SoftWindows is the only product licensed by the license server, you can prevent the licensing daemon from running each time the machine starts by performing the following procedure:

1. Log in as root on the license server.
2. In */etc/inittab* comment out the line beginning with *isl*.

Software installed by the installation procedure

The following files are installed in the SoftWindows installation directory by the installation procedure:

Table 5-1 Software installed by the installation procedure

File	Description
<i>bios1.rom</i>	SoftWindows ROM-based BIOS emulation file
<i>bios2.rom</i>	SoftWindows ROM-based BIOS emulation file
<i>bios4.rom</i>	SoftWindows ROM-based BIOS emulation file
<i>v7vga.rom</i>	SoftWindows ROM-based Video-7 graphics emulation file
<i>sys.swinconfig</i>	Default SoftWindows configuration file
<i>sys.diskdata*</i>	Data file to create a bootable Windows hard disk file
<i>sys.swinerrdb</i>	SoftWindows X-error database and
<i>sys.swinemptydata</i>	Data to create an empty hard disk file.
<i>sOfWindows</i>	X-resource file for SoftWindows
<i>README</i>	Additional information about SoftWindows
<i>update.hdf</i>	Used to upgrade hard disks.
*Optional.	

The following directories are installed in the SoftWindows installation directory:

Table 5-2 Directories installed by the installation procedure

Directory	Description
<i>bin</i>	Programs and scripts
<i>FLEXlm</i>	Licensing system files
<i>fonts</i>	Fonts used by SoftWindows
<i>keyboard</i>	Keyboard mapping files
<i>local</i>	MS-DOS and Microsoft Windows localization files

Table 5-2 (continued) Directories installed by the installation procedure

Directory	Description
<i>man</i>	SoftWindows and licensing system manual pages
<i>windows+</i>	Network installation of Microsoft Windows 3.11
<i>winsetup*+</i>	Microsoft Windows 3.11 setup data
<i>win95*</i>	Microsoft Windows 95 setup data
	* Optional.
	+ Upgrade installations only

Files installed on the SoftWindows hard disk

The following directories are installed on the C: drive:

Table 5-3 Directories Installed on the C: Drive

Directory	Description
<i>ACROREAD</i>	Adobe Acrobat Reader 2.1 files
<i>INSIGNIA</i>	SoftWindows utilities and drivers
<i>NWCLIENT</i>	Novell Netware Client for DOS and MS Windows files
<i>PKZIP</i>	Pkzip files
<i>PPVIEW32</i>	Microsoft PowerPoint Viewer for Windows 95 Version 7.0 files
<i>PROGRAM FILES</i>	Windows 95 applications
<i>STUFFIT</i>	Aladdin Systems Stuffit Expander Version 1.0 files
<i>WINDOWS</i>	Microsoft Windows files
<i>WNPST</i>	WINPOST setup files

The following files are installed in the C:\ directory:

Table 5-4 Files Installed on the C: Drive

Directory	Description
<i>COMMAND.COM</i>	The MS-DOS command line interpreter. This is a standard part of MS-DOS and should not be modified.
<i>CONFIG.SYS</i>	MS-DOS boot configuration file. This is used to set MS-DOS configuration options and load drivers when SoftWindows is started.
<i>AUTOEXEC.BAT</i>	MS-DOS batch program executed when MS-DOS starts up. This is used to set MS-DOS configuration options and load drivers when SoftWindows is started.

When you install an MS-DOS application, the installer may modify the *CONFIG.SYS* and *AUTOEXEC.BAT* files for you or instruct you to modify them. Use any text editor, such as MS-DOS EDIT, to do this.

Default VFSA drive configuration

The following VFSA drives are configured by default:

Table 5-5 VFSA drives configured by default

VFSA drive	Description
E: \$HOME H: \$HOME	The user's UNIX home directory. Fileshare can normally be modified by the user.
G: \$SWINHOME/win95	The Windows 95 setup directory, used when installing additional components of Windows 95. (Full installations only. Requires the MS-Windows setup files option to be selected during the installation).
G: \$SWINHOME/windows	The Windows 3.11 setup directory, used when installing additional components of Windows 3.11. (Upgrade installation only).

SoftWindows licensing

Licensing SoftWindows

This chapter gives additional information about the FLEXlm licensing system and explains how to use the SoftWindows License Manager to modify a license. SoftWindows is supplied with FLEXlm version 4.1, running *lmgrd* version 5.0B.

This chapter covers the following topics:

- “The FLEXlm licensing system”
- “Using FLEXlm”
- “Modifying SoftWindows licenses”
- “Licensing SoftWindows with other products using FLEXlm”
- “License administration tools”
- “Hostids for FLEXlm-supported machines”

The FLEXlm licensing system

SoftWindows uses a licensing system called FLEXlm nodelock, which lets you administer the licenses for all users on a network from a single workstation. This workstation is known as the *license server*. The FLEXlm nodelock system is widely used by a number of different software manufacturers, and one license server is sufficient to control any number of software products on the network.

The license server runs a licensing daemon, *lmgrd*, which invokes a specific daemon for SoftWindows, called *insignia*. The licensing daemon accesses a license data file, *license.dat*, which contains information about the license server and the licensed products. By default, this file is located in the directory, *\$SWINHOME/FLEXlm*, where *\$SWINHOME* is the SoftWindows installation directory.

A typical *license.dat* file looks like the following example:

```
SERVER sylph 690c1e3a 744
DAEMON insignia /usr/lib/SoftWindows/FLEXlm
FEATURE Insignia_SoftWindows95 insignia 1.0 01-jan-00 0
2C81B6AC6D7364E8A70B VENDOR_STRING="5000 1234 5678 0000"
HOSTID=690c1e3a ISSUER="Silicon Graphics, Inc."
```

The `SERVER` line specifies the location of the server.

The `DAEMON` line specifies the pathname of the *insignia* licensing daemon.

The `FEATURE` line specifies the licensing information for SoftWindows. Note that this is one line that may wrap onto two lines when displayed, as shown in the example.

The `SERVER` and `DAEMON` lines are added to the *license.dat* file by the License Manager dialog box and may be modified later by the administrator.

The *license.dat* file is generated by the License Manager dialog box, which is displayed automatically when SoftWindows is run as root with no license server running. It can also be displayed by choosing Licensing from the Actions menu when SoftWindows is run as root.

If you are installing a demo license, no license server is needed. If you are already using FLEXlm, you should install the demo license on your existing license server.

The TCP port number

FLEXlm runs over TCP and uses the socket assigned in the *license.dat* file on the server. For example, in the line:

```
SERVER waltz 35648797 744
```

744 is the TCP port number which the software has assigned to FLEXlm. This number can be changed but 744 is the default.

The TCP number is important, because if the system in the above example is a license server, FLEXlm uses this number to locate the server for users on other systems. To do this, each user must set the `LM_LICENSE_FILE` environment variable, which takes the form `port @ server`. Thus, to use the above license server, `LM_LICENSE_FILE` should be defined as follows for a C shell:

```
setenv LM_LICENSE_FILE 744@waltz
```

or for a Bourne or Korn shell:

```
LM_LICENSE_FILE=744@waltz; export LM_LICENSE_FILE
```

Alternatively, the variable `LM_LICENSE_FILE` can be set to reference the license file on the license server. For example, if you have a license server called `licserv`, and it contains a license file in a FLEXlm directory, which is NFS mounted under `/servers/licserv`, then `LM_LICENSE_FILE` could be set to `/servers/licserv/FLEXlm/license.dat`.

In this case, SoftWindows reads the `SERVER` line in the license file for the name of the license server to which the TCP port should be connected.

Using FLEXlm

The procedures for starting and stopping FLEXlm must be carried out as root.

There are two ways to start FLEXlm using the `lmgrd` utility, in addition to using the user interface.

To start FLEXlm manually

The disadvantage of starting FLEXlm manually is that FLEXlm will need to be restarted if the machine is rebooted.

Enter the command for the Bourne shell:

```
$SWINHOME/FLEXlm/lmgrd -c $SWINHOME/FLEXlm/license.dat >  
$SWINHOME/FLEXlm/lmgrd.log 2>&1 &
```

Note: This command should be typed on a single line.

To start FLEXlm automatically

You can set up the license system so that it starts during the boot sequence of the license server as follows:

1. Add the following line to the */etc/inittab* file:

```
isl:234:respawn:$SWINHOME/FLEXlm/lmgrd -c  
$SWINHOME/FLEXlm/license.dat > $SWINHOME/FLEXlm/lmgrd.log 2>&1
```

where *\$SWINHOME* is the SoftWindows installation directory; for example, */usr/lib/SoftWindows*.

Note: This command should be typed on a single line.

2. After adding the above line to the relevant system file, type the following command to start FLEXlm:

```
/etc/init q
```

This causes the system to reread the */etc/inittab* file.

To shut down FLEXlm

The FLEXlm licensing system should be shut down before deinstalling SoftWindows, if it has been modified in any way from the default SoftWindows installation.

- If FLEXlm was started manually, type the following command:

```
$SWINHOME/FLEXlm/lmdown
```

or, if *LM_LICENSE_FILE* is not set, enter:

```
$SWINHOME/FLEXlm/lmdown -c $SWINHOME/FLEXlm/license.dat
```

- If the system was started automatically and you want to remove FLEXlm, delete the line that was added to the */etc/inittab* or */etc/rc.local* file, and enter the following command at the UNIX prompt:

```
/etc/init q
```

This causes the system to reread the */etc/inittab* file.

To set up multiple license servers

At startup, SoftWindows contacts the license server to obtain a valid license. You can set up multiple license servers, so if there are no licenses available on the preferred server, SoftWindows will automatically ask for a license from the next named server.

To set up multiple license servers, define the `LM_LICENSE_FILE` environment variable at the UNIX prompt as follows:

- For C shell users:

```
setenv LM_LICENSE_FILE 744@waltz:755@tango
```

- For Bourne or Korn shell users:

```
LM_LICENSE_FILE=744@waltz:755@tango <Enter>  
export LM_LICENSE_FILE
```

To run *lmgrd* as non-root

GLOBEtrouter recommend that *lmgrd* is run by a non-privileged user to avoid a vulnerability in security.

The way in which SoftWindows is installed should avoid the need to do this. Because running as another user requires knowledge of the customer's user-id allocation, license daemons installed via the SoftWindows user interface are therefore still run as root. However, if you prefer to avoid running *lmgrd* as root, follow this procedure.

Note: Other applications on your systems (including earlier versions of SoftWindows software) may also be using FLEXlm.

1. Create a non-privileged account for use by FLEXlm. For example:

```
flexlm:*:2000:250:FLEXlm License Manager:/nonexistent:/bin/sh
```

The account must have the following properties:

- Password set to '*', as interactive access is not required.
- A unique userid (2000 in the example above).
- A unique groupid (250 in the example above).
- A shell of `/bin/sh`.

2. Locate the license file. For SoftWindows the default is `$SWINHOME/FLEXlm/license.dat`.

The license management daemons must use a non-privileged TCP port (that is, greater than 1024) for communication. The port number chosen may be arbitrary, but the port must not clash with that used by other applications.

The port is specified in the license data file, in the fourth field along the `SERVER` line. For example:

```
SERVER xyzzy 123456789 6744
```

In the above example the port number is 6744.

If you use the environment variable `LM_LICENSE_FILE`, this should be changed, for example, to `6774@server-name`.

3. Locate where the FLEXlm license management daemon is started.

For SoftWindows 95 this is in `/etc/inittab`.

4. Find the command line containing `'lmgrd'`.
5. Modify this command to look like this:

```
su flexlm -c "umask 022; {original command}"
```

assuming that you created the user `flexlm` in the first step above.

Note: The logging information that is written to stdout from the daemon should not be written to files in `/tmp` or other world writable directories, but to a specially created directory to which the `flexlm` user can write log information.

6. Make sure that the only files on the system that are owned or writable by the `flexlm` user are the log files. All license and FLEXlm executable files must be readable or executable by the `flexlm` user.

Additional daemons required by the FLEXlm license management daemon are specified in the license data files. For SoftWindows this is the `'insignia'` daemon (by default located in `$SWINHOME/FLEXlm`).

Modifying SoftWindows licenses

SoftWindows includes a Licensing function that allows you to view the licensing information for your SoftWindows installation and, if necessary, update it if you want to extend the license period or add more users.

To display the License Manager

1. Log in as root.
2. Run the appropriate window manager (VUE, OpenWindows, CDE, or Motif).
3. Run SoftWindows.

An additional Licensing option will then be available on the Actions menu.

4. Choose Licensing from the Actions menu.

This dialog box displays the licensing information for your SoftWindows installation:

To install a new license

1. Choose the type of license by selecting Demonstration, Concurrent, or nodelock as appropriate.
2. Enter the Serial Number, Expiry Date, Authorization Code, and the Number Of Users in the appropriate text boxes.

Note: If Demonstration has been selected as the license type, the Number Of Users field is disabled. Alternatively, if the license type Concurrent is selected, the Expiry Date is automatically set to 1/1/0 and should not be changed.

3. Choose Install License to install the new license.

To run SoftWindows on a network that is currently using FLEXlm

1. Copy the relevant details from the file `$SWINHOME/FLEXlm/license.dat` into your own `license.dat` file, and remove the original file. You can supply authorization codes for multiple redundant servers so that large networks are not totally reliant on one machine.

This level of complexity is not supported by the SoftWindows license manager dialog box, so the files must be edited manually.

2. Set up the `LM_LICENSE_FILE` environment variable for each user, to specify the location of the existing license file.

- For a C shell user, add one of the following lines to the `.login` file:

```
setenv LM_LICENSE_FILE 744@machine  
setenv LM_LICENSE_FILE /net/machine/$SWINHOME/FLEXlm/license.dat
```

In the first case, enter the appropriate TCP port number and machine name. In the second case, enter an appropriate path through an NFS mount to the license file on the license server.

- For a Bourne shell user, add one of the following lines to the `.profile` file:

```
LM_LICENSE_FILE=744@machine; export LM_LICENSE_FILE  
LM_LICENSE_FILE=/net/machine/$SWINHOME/FLEXlm/license.dat;  
export LM_LICENSE_FILE
```

In these examples `$SWINHOME` is the SoftWindows installation directory.

To change the TCP port used for licensing

The TCP port used for licensing can be changed to avoid a clash with another TCP service on the standard port. You should only do this if you are experienced in using the UNIX system.

1. Log in as root.
2. Run the appropriate window manager (VUE, OpenWindows, IBM CDE, or Motif).

3. Run SoftWindows
4. Choose Licensing from the Actions menu to display the license manager dialog box.
5. Choose Advanced to display the TCP Port section of the dialog box:
6. Enter a new TCP port number.

Note: If you enter an invalid port number, SoftWindows will not work.

Licensing SoftWindows with other products using FLEXlm

If other products on your network use FLEXlm licensing, a conflict may occur with the SoftWindows licensing system.

This section discusses how to avoid this problem.

Products using the same license server

In this case, there are two solutions:

- The end-user can keep both license files separate, running two copies of *lmgrd*, one for each license file.

There is no drawback in this approach, since each *lmgrd* requires few system resources and takes almost no CPU time.

- You can combine license files by retaining the set of `SERVER` lines from any one license file and adding all the other lines (`DAEMON`, `FEATURE`, `INCREMENT`, `UPGRADE`, and `FEATURESET` lines) from all the license files. The combined license file can be located in the default location, */usr/local/flexlm/licenses/license.dat*, or in any convenient location (which must be set in the `LM_LICENSE_FILE` environment variable). Alternatively, multiple copies of the file can be located at fixed locations as required by each software vendor.

You must create a symbolic link between the location of the license file and the location where each software package expects to find its license file.

Note: Experienced system administrators often prefer to combine license files; otherwise you are advised to keep these files separate.

Products using different license servers

In this case, separate license files will be required, one for each distinct set of license servers. Where multiple software vendors use the same set of license server nodes, the technique described in the previous section can be used to combine their license files. The resulting (multiple) license files can then be installed in convenient locations, and the user's `LM_LICENSE_FILE` environment variable should be set as follows.

```
setenv LM_LICENSE_FILE 1fpath1:1fpath2:....:1fpathN
```

where *1fpath1* is the path to the first file, *1fpath2* is the path to the second license file, and so on.

When products from different vendors use different versions of FLEXlm, always use the latest versions of the *lmgrd* and the *lmutil* utilities. If any products use a version of FLEXlm before v2.0, then the **-b** startup argument must be used for *lmgrd*.

The latest version of *lmgrd* will always support any FLEXlm license. The end-user must verify which *lmgrd* is the latest version. This can be done using `lmgrd -v` to get the version information. If you are using a version of *lmgrd* earlier than the version the vendor is using, error messages may appear such as:

Vendor daemon cannot talk to *lmgrd* (invalid returned data from license server).

FLEXlm version compatibility

When an end-user has licensed products that incorporate various versions of FLEXlm, care must be taken to insure that the correct versions of *lmgrd* and the FLEXlm utilities are used.

If the utility programs are FLEXlm v2.4 or later, the latest utility programs should be used. If the utility programs are older than v2.4, the oldest (lowest version number) utility programs should be used. This is because the newest *lmgrd* knows how to support all versions of the vendor daemons, whereas utilities prior to FLEXlm v2.4 do not know how to communicate with the older vendor daemons. After FLEXlm v2.4, the utility programs automatically back off their communications version to enable them to work with *all* versions of the FLEXlm daemons.

To determine the version of any FLEXlm-based product, use the following command as root:

```
strings program_name | grep Highland | grep -i flex
```

or

```
strings program_name | grep Globetrotter | grep -i flex
```

Once you have determined the versions of all software you want to use, perform the following procedure:

- Use the highest numbered *lmgrd* that you have.
- Use the FLEXlm utilities that correspond to the oldest client or vendor daemon that you have in use or use the newest utilities if they are FLEXlm v2.4 or newer.

If you have vendor daemons with different FLEXlm versions:

- If all vendor daemons are later than v2.0, use the latest *lmgrd* with no options.
- If you have all FLEXlm v1.x and v2.1 and the newer vendor daemons, use the latest *lmgrd* with the **-b** option.
- FLEXlm v1.x and v2.0 daemons cannot be combined. If you have a combination that includes FLEXlm v1.x and v2.0 daemons, keep them in separate files. Group them so that they follow the two guidelines above. Note that few vendors use v2.0 daemons.

License administration tools

This section describes the license administration tools supplied with FLEXlm. The commands for the tools are contained in a single utility, *lmutil*, and can be run by typing one of the following commands:

```
lmutil commandname
```

```
commandname
```

All the utilities take the following arguments:

Argument	Description
<i>-v</i>	Print version and exit
<i>-c license_file</i>	Operate on <i>license_file</i>

Note: The *lmdown*, *lmremove*, and *lmreread* commands are limited to privileged users. If you have started *lmgrd* with the **-p** switch, you must be a license administrator to run any of these three utilities. A license administrator is a member of the UNIX *lmadmin* group or a member of group 0, if the *lmadmin* group does not exist.

The file *lmgrd.log* contains a log of all FLEXlm activities, and provides useful information for debugging FLEXlm.

lmcksum

Performs a checksum of a license file, and prints a line-by-line checksum for the file as well as an overall file checksum. This can be used to verify that a license has been entered correctly.

By default, *lmcksum* operates on *license.dat* in the current directory and may be invoked with an optional daemon name. If this is specified, only license file lines for the selected daemon are used to compute the checksums.

lmdown

Shuts down all license daemons (both *lmgrd* and all vendor daemons) on all nodes.

The utility shuts down all daemons specified in the default license file, which is vendor-specific, or in the license file pathname as defined by the environment variable *LM_LICENSE_FILE*.

By default, the SoftWindows licensing is automatically restarted by a line in the file */etc/inittab* (or on SunOS at reboot by a line in */etc/rc.local*). For details of how to shut down FLEXlm refer to “To shut down FLEXlm.”

lmhostid

Prints the host ID value on any machine supported by FLEXlm.

lmremove

Removes a user's license for a specified product and returns the license to the pool of available licenses.

This could be required if there is a system failure on the node where the user is running the software. Due to the way TCP works it can take several hours for the license server to detect that the user's system has failed. This situation sometimes leaves the license in an unusable state.

Syntax

```
lmremove [-c file] feature user host display
```

The *user host display* information is obtained from the output of the command *lmstat -a*.

The *lmremove* utility removes all instances of *user* on *host* on *display* from usage of *feature*. If the optional *-c file* parameter is specified, the indicated file is used as the license file. You should protect the execution of *lmremove*, since removing a user's license can be disruptive.

lmreread

Instructs the license daemon to reread the license file and start all new vendor daemons that have been added. In addition, all preexisting daemons will be signaled to reread the license file for changes in feature-licensing information.

If an optional daemon name is specified, only the named daemon will reread the license file. In this case, *lmgrd* does not reread the license file.

lmstat

Displays the status of all network licensing activities to allow you to monitor license management operations, including:

- Which daemons are running
- Users of individual features
- Users of features served by a specific daemon

The *lmstat* utility allows the following options:

Table 6-1 lmstat Options

Option	Description
-a	Display all licensing information.
-A	List all active licenses.
-c <i>license_file</i>	Use <i>license_file</i> .
-S [<i>daemon</i>]	Restrict output to one daemon, and the features and users of that daemon.
-f [<i>feature_name</i>]	List users of named feature or all features if no feature name is given.
-i [<i>feature_name</i>]	Prints information about the named feature or all features if no feature name is given.
-l [<i>regular expression</i>]	List users of matching license(s).
-s [<i>server_name</i>]	Display status of named server node or of all servers if no server name is given.
-t <i>value</i>	Set <i>lmstat</i> timeout to <i>value</i> .

Note: The command *lmremove* uses the output from *lmstat -a*.

lmswitchr

Switches the report writer (*REPORTLOG*) log file for the specified feature.

lmver

Reports the FLEXlm version of the library or binary. Usage is:

lmver [*filename*]

If *filename* is specified, the FLEXlm version incorporated into this file is displayed; otherwise *lmver* looks for the library file *liblmgr.a* to detect its version.

Hostids for FLEXlm-supported machines

FLEXlm uses different machine identifications for different machine architectures. For this reason, the Ethernet address is used on some platforms as the host ID.

An Ethernet address is a 6-byte string, with each byte comprising two hexadecimal digits. You should specify all 12 hex digits when using an Ethernet address as a hostid. For example, if the Ethernet address is *8:0:20:0:5:ac*, you would specify **0800200005ac** as the hostid.

The program *lmhostid* will print the exact hostid that FLEXlm expects to use on any host.

Type:

```
echo `cat /etc/sysinfo -s` 16o p | dc
```

to obtain the required hostid.

SoftWindows configuration

Configuring SoftWindows

This chapter describes the SoftWindows system configuration and user configuration files, and the X-resource configuration options. It covers the following topics:

- “SoftWindows configuration file”
- “X resource configuration”

SoftWindows configuration file

Each user’s configuration settings are stored in a file named *swinconfig* in the user’s home directory. This file determines the settings that appear in the Options menu dialog boxes. If the user changes any of the settings, and the Save Configuration Changes option is checked in the Exit dialog box, the new values will be saved in the user’s configuration file on exiting SoftWindows.

You can also edit the SoftWindows configuration file using a UNIX text editor, such as *vi*.

The system defaults

When a user launches SoftWindows, the initial configuration settings are determined by the system configuration file, *sys.swinconfig*, which is installed in the SoftWindows installation directory.

Editing the system configuration file

The system administrator can edit the system configuration file to provide users with different initial settings.

After it is edited *sys.swinconfig* must be owned by root, and the SUID bit must be set. If necessary, login as root and from the *\$SWINHOME* directory enter the commands:

```
chown root sys.swinconfig
chmod 4444 sys.swinconfig
```

The system configuration file also contains entries to determine the default values for the LPT and COM port settings, the maximum size of the hard disk drive and memory, and the initial size of the Windows desktop.

System configuration file

A full listing of the SoftWindows system configuration file is given on the following pages. The following entries determine the user's initial SoftWindows preferences:

```
DRIVE_C_FILE_NAME           $HOME/WIN95-username.hdf
DRIVE_D_FILE_NAME
DRIVE_CDROM_DEVICE_NAME
DRIVE_D_FSA_DIRECTORY
DRIVE_E_FSA_DIRECTORY       $HOME
DRIVE_F_FSA_DIRECTORY
DRIVE_G_FSA_DIRECTORY
DRIVE_H_FSA_DIRECTORY       $HOME

DRIVE_Z_FSA_DIRECTORY
DRIVE_FLOPPY_A_DEVICE_NAME
DRIVE_FLOPPY_B_DEVICE_NAME
DISPLAY_GRAPHICS_ADAPTOR    SVGA
DISPLAY_SIZE                1.0
DISPLAY_MSWIN_WIDTH         640
DISPLAY_MSWIN_HEIGHT       480
DISPLAY_MSWIN_COLOURS      16
MEMORY_EXTENDED_SIZE        16
```

```
LPT_PORT_1_TYPE
LPT_PORT_2_TYPE
LPT_PORT_3_TYPE
LPT_PORT_1
LPT_PORT_2
LPT_PORT_3
LPT_PORT_1_PS_FLUSH          No
LPT_PORT_2_PS_FLUSH          No
LPT_PORT_3_PS_FLUSH          No
COM_PORT_1_TYPE
COM_PORT_2_TYPE
COM_PORT_3_TYPE
COM_PORT_4_TYPE
COM_PORT_1
COM_PORT_2
COM_PORT_3
COM_PORT_4
COM_PORT_1_PS_FLUSH          No
COM_PORT_2_PS_FLUSH          No
COM_PORT_3_PS_FLUSH          No
COM_PORT_4_PS_FLUSH          No
COM_PORT_1_FLOW              No
COM_PORT_2_FLOW              No
COM_PORT_3_FLOW              No
COM_PORT_4_FLOW              No
SECURE                        No
SECURE_MASK                   0
SOUND                         No
AUTO_FREEZE                   No
AUTO_FLUSH                     Yes
FPU_EMULATION                 Yes
AUTO_FLUSH_DELAY              50
KEYBOARD_MAP_FILE_NAME       $$SWINHOME/keyboard/kbd †
FILE_DEFAULT                   $HOME/SoftWin.tmp
DEVICE_DEFAULT                 device †
PIPE_DEFAULT                   lp
DRIVE_HARD_DISK_MAX_SIZE      500
MEMORY_EXTENDED_MAX_SIZE      32
MSWIN_RESIZE                   Next
CMOS                           bytes *
DRIVE_D_FSA_OPTION            Lower
.
.
```

```

DRIVE_Z_FSA_OPTION           Lower
DISK_DEFAULT_SIZE           180
WINDOW_RESIZE_MODE           Smart
TURBO_START_FILE_NAME       $HOME/.swinturbo
DEFAULT_ETHERNET_DEVICE
DEFAULT_TOKENRING_DEVICE
MUTE_WINDOWS_SOUND           No
IGNORE_WINDOWS_VOLUME       No
    
```

† These items depend on the SoftWindows platform and the configuration of the workstation. The typical value of kbd is *SGINDYus.kbd*.

* The CMOS line lists 64 hexadecimal numbers, separated by spaces.

The following sections provide details of the alternative values for particular configuration entries:

MSWIN_RESIZE

Table 7-1 MSWIN_RESIZE Values

Value	Description
Never	The Resize dialog box is not displayed when Windows is started.
Always	The Resize dialog box is displayed every time Windows is started.
Next	The Resize dialog box is displayed the next time Windows is started. After it has been displayed the option is automatically set to Never so that the dialog box is not subsequently displayed.

LPT_PORT_x_TYPE

Table 7-2 LPT_PORT_x_TYPE Values

Value	Description
File	Output to a UNIX file.
Pipe	Pipe to a UNIX process (for example, a print spooler).
Device	Output to a UNIX serial port.
Blank	Port disabled.

COM_PORT_x_TYPE

Table 7-3 COM_PORT_x_TYPE Values

Value	Description
File	Output to a UNIX file.
Pipe	Pipe to a UNIX process (for example, a print spooler).
Device	Output to a UNIX serial port.
Blank	Port disabled.

DISPLAY_GRAPHICS_ADAPTOR

Table 7-4 DISPLAY_GRAPHICS_ADAPTOR Values

Value	Description
VGA	SVGA display.

DRIVE_x_FSA_OPTION

Table 7-5 DRIVE_x_FSA_OPTION Values

Value	Description
Lower	Files are saved to VFSA drives in lower case
Upper	Files are saved to VFSA drivers in upper case.
Insensitive	Case is irrelevant.

WINDOW_RESIZE_MODE

Table 7-6 WINDOW_RESIZE_MODE Values

Value	Description
Smart	the Windows 95 desktop is automatically resized when the SoftWindows window is resized.
None	The SoftWindows window cannot be resized.
Restart	Resizing the SoftWindows prompt the user to restart SoftWindows, for use with Windows 3.11.

RO_DISK_PANEL_DISABLE

This entry is optional. If a user does not have write permission to a SoftWindows hard disk file, a warning dialog box will normally be displayed when SoftWindows starts up. The option *RO_DISK_PANEL_DISABLE* allows you to override this default action as follows:

Table 7-7 RO_DISK_PANEL_DISABLE Values

Value	Description
No or omitted	The warning dialog box will be displayed if the user cannot write to the disk.
Yes	The warning dialog box is not displayed.

_DEFAULT entries

The _DEFAULT entries can be changed by the system administrator to determine the default values for the options in the Comms Ports and Lpt Ports dialog boxes.

`_MAX_SIZE` entries

The `_MAX_SIZE` entries can be changed by the system administrator to determine the maximum disk and memory sizes.

User's configuration file

The following entries do not appear in the user's individual configuration file (`$HOME/.swinconfig`): `FILE_DEFAULT`, `DEVICE_DEFAULT`, `PIPE_DEFAULT`, `SECURE`, `SECURE_MASK`, `DRIVE_HARD_DISK_MAX_SIZE`, and `MEMORY_EXTENDED_MAX_SIZE`.

`SECURE` is optional, but if it is not preset, the default value assumed is *Yes*, so it should be preset to *No* if secure mode operation is not required.

`SECURE_MASK` is intended for future expansion and should be set to *0*.

Resetting the configuration

You can reset a user's SoftWindows preferences to the default values supplied in the system configuration file by deleting the `.swinconfig` file in the user's home directory.

When launched, SoftWindows will create a default file there if one does not already exist.

X resource configuration

Since SoftWindows is an X Windows-based application, you can restrict access to parts of the SoftWindows menu tree by editing the SoftWindows X resource file, *sOfWindows*, located in *\$SWINHOME*.

When editing the SoftWindows X resource file note that the X resource name *sOfWindows* must start at the beginning of the line. The value field must be separated from the name by spaces or tabs, and there must be no extra spaces or tabs at the end of the line.

Disabling menu options

Each menu item can be individually grayed out by setting its sensitive setting to false. For example, to restrict users from accessing the Display... option, locate the following line in the *sOfWindows* file:

```
sOfWindows*dispPBG.sensitive:true
```

And change it to:

```
sOfWindows*dispPBG.sensitive:false
```

Alternatively, you can gray out entire menu options, by setting the *sensitive* setting of the parent menu option to *false*. For example, to restrict users from accessing the entire Options menu, locate the following line in the *sOfWindows* file:

```
sOfWindows*optionCBW.sensitive:true
```

And change it to:

```
sOfWindows*optionCBW.sensitive:false
```

To restrict users from accessing any of the SoftWindows menus, except for the Help menu, change the following lines in the *sOfWindows* file:

```
sOfWindows*fileCBW.sensitive:true  
sOfWindows*optionCBW.sensitive:true  
sOfWindows*actionCBW.sensitive:true
```

To the following:

```
sOfWindows*fileCBW.sensitive:false  
sOfWindows*optionCBW.sensitive:false  
sOfWindows*actionCBW.sensitive:false
```

Menu font sizes

To change the fonts on the SoftWindows menus, either edit the following line in the *sOfWindows* file, if present, or add a similar line to the file:

```
sOfWindows*FontList:screen14
```

Windows driver display sizes

When the user launches Microsoft Windows, depending on the current *MSWIN_RESIZE* configuration setting, the Resize dialog box may appear. This allows the user to select the size of the user's Microsoft Windows desktop. The sizes provided in the Resize dialog box are set in the SoftWindows resource file, *sOfWindows*, and are defined using the following lines:

```
sOfWindows*stdScreenSize1:    640    480  
sOfWindows*stdScreenSize2:    800    600  
sOfWindows*stdScreenSize3:   1024    768  
sOfWindows*stdScreenSize4:   1152    864  
sOfWindows*stdScreenSize5:   1152    864
```

To change the default size settings, simply modify the relevant lines. For example, to make the fifth default size equal to 1600 x 1200, change the last line to:

```
sOfWindows*stdScreenSize5:   1600   1200
```

Tuning the performance of SoftWindows

This chapter outlines several alternative options for installing and using SoftWindows on a UNIX network.

It also discusses the factors affecting the performance of SoftWindows and tells you how to tune them effectively.

For information on how to install SoftWindows, Windows applications, and MS-DOS applications in various configurations, refer to the following sections of the SoftWindows documentation.

- SoftWindows – see Chapter 3, “Installation.”
- Microsoft Windows applications – see “Using Windows” in the *SoftWindows 95 for UNIX User’s Guide*.
- MS-DOS applications – see “Using MS-DOS” in the *SoftWindows 95 for UNIX User’s Guide*.

Installation Option 1

- Install SoftWindows on the local workstation (15 MB minimum per workstation).
- Create each user's hard disk file on the local workstation (180 MB minimum per user).
- Install applications on the local workstation.
- Run SoftWindows on the local workstation.

Overview

This option provides the best SoftWindows performance since the user's network does not play a major role. However, one of the disadvantages is that SoftWindows can take up a significant amount of total hard disk space since each user needs to have SoftWindows, Microsoft Windows 95, and applications installed on the local hard disks.

Advantages

- The best SoftWindows performance because all files are accessed from the local hard disk, and there are no network load issues involved in running SoftWindows files.
- SoftWindows has access to the local workstation's devices, such as floppy disk drives, CD-ROM, and comms ports.
- Complete control over environment.
- Stand-alone operation – do not have to rely on the operation of the network.

Disadvantages

- Requires hard disk space on each local workstation to store both the SoftWindows and application files.
- SoftWindows and application software updates have to be applied to each local workstation.

Installation Option 2

- Install SoftWindows on the local workstation (15MB minimum per workstation).
- Create each user's hard disk file on the local workstation (180 MB minimum per user).
- Install applications on an NFS server.
- Run SoftWindows on local workstation.

Overview

This option generally provides lower performance than Option 1 because SoftWindows has to access the network when running each application. However, this allows the user to have one installation of each application, thereby saving hard disk space. Furthermore, upgrading an application only needs to be carried out once on the NFS server instead of on each local workstation as in Option 1.

Advantages

- Fast SoftWindows performance.
- If the NFS mount is fast, this option could be as fast as Option 1.
- SoftWindows has access to the local workstation's devices, such as floppy disk drives, CD-ROM, and comms ports.
- Requires less local hard disk space than Option 1.
- Application and user files can be centrally managed and upgraded from the NFS server.

Disadvantages

- Requires at least 200 Mbytes of hard disk space on each local workstation.
- The SoftWindows software updates have to be applied to each local workstation.

Installation Option 3

- Install SoftWindows on the local workstation (15 MB minimum per workstation).
- Create each user's hard disk file on the local workstation (180 MB minimum per user).
- Install applications on a PC LAN file server.
- Run SoftWindows on the local workstation.

Overview

This option generally provides lower performance than Option 1 because SoftWindows has to access the network when running each application. However, this allows the user to have one installation of each application, thereby saving hard disk space. Furthermore, upgrading an application only needs to be carried out once on the PC LAN file server instead of on each local workstation as in Option 1.

Advantages

- Generally good SoftWindows performance.
- SoftWindows has access to the local workstation's devices, such as floppy disk drives, CD-ROM, and comms ports.
- Requires less local hard disk space than Option 1.
- Application and user files can be centrally managed and upgraded from the PC LAN server.
- Applications can be shared with the users using real PCs and SoftWindows PCs on the PC LAN server.

Disadvantages

- Typically slower than Option 1 or Option 2.
- Requires at least 200 Mbytes of hard disk space on each local workstation.
- The SoftWindows software updates have to be applied to each local workstation.

- Accessing application and user files from a typical PC LAN via PC networking software is generally slower than accessing the same files from a typical NFS server.
- Only one local SoftWindows instance at a time can use the applications on the PC LAN file server; that is, multiple SoftWindows instances and/or processes on the same workstation cannot simultaneously access the PC LAN file server.

Installation Option 4

- Install SoftWindows once on an NFS server (15MB minimum).
- Install applications on an NFS server.
- Run SoftWindows on the local workstation via NFS (no local SoftWindows files installed).
- Create bootable SoftWindows hard disk file for each user on the NFS server (180MB minimum per user).

Overview

This differs from Option 1 in that all of the SoftWindows files are installed on the NFS server instead of on the local workstation.

Advantages

- Saves local workstation hard disk space since only the server needs to have a copy of the SoftWindows and application files.
- If the NFS server access is at least as fast as local hard drive access, this option could be nearly as fast as Option 1.
- SoftWindows and application updates need only be applied to the server.
- SoftWindows has access to the local workstation's devices, such as floppy disk drives, CD-ROM, and comms ports.
- Local workstations may be diskless.

Disadvantages

- Accessing SoftWindows and application files from an NFS server is generally slower than accessing them from a local hard disk.
- Possible problems with NFS and SUID bit permissions.

Installation Option 5

- Install SoftWindows once on an NFS server (15MB minimum).
- Create each user's hard disk file on the local workstation (180 MB minimum per user).
- Install applications on an NFS server.
- Run SoftWindows on the local workstation via NFS.

Overview

Typically used when local workstation hard disk space is valuable, but performance is a major consideration. This option is the same as Option 4, but with some possible performance improvements as a result of having hard disk files installed on the local workstation.

Advantages

- Optimization of the smallest local workstation footprint with the best performance.
- SoftWindows has access to the local workstation's devices, such as floppy disk drives, CD-ROM, and comms ports.

Disadvantages

- Accessing SoftWindows and application files from an NFS server is generally slower than accessing them from a local hard drive.
- Possible problems with NFS and SUID bit permissions.

Installation Option 6

- Install SoftWindows and each user's hard disk file on a remote UNIX workstation (15 MB + 180 MB minimum).
- Install applications on a remote UNIX workstation.
- Remotely run SoftWindows on the remote UNIX workstation, but display it on the local workstation via an X Server.

Overview

This option enables X terminals and UNIX workstations with X Windows to run SoftWindows via an X server display. SoftWindows and the applications are installed on the remote UNIX workstation, and multiple instances of SoftWindows are run on the remote UNIX workstation and displayed via an X server on the local workstation or X terminal.

Advantages

- Can be used with X terminals.
- Does not use any local workstation space for SoftWindows or application files.
- SoftWindows and application updates need only be applied to the remote UNIX workstation.
- The performance of the local workstation is impacted only by the X server display operations and not the SoftWindows or application executables.
- The performance with an X server display may be significantly better than with the other options on the same workstation.

The performance seen on the local X server display is a function of the performance of the remote UNIX workstation running SoftWindows, the network performance, and the local workstation's load in handling X server functions.

Disadvantages

- Accessing SoftWindows files over the network may be slow.
- Running multiple copies of SoftWindows on a single remote UNIX workstation can quickly reduce the performance of each of the local workstations on their local X server displays.
- Only one instance of SoftWindows can access PC networking at a time on a single workstation. This means that when there is more than one instance of SoftWindows running, only one instance can use the PC networking.

One possible solution to this networking limitation would be to store any data or applications files on an NFS server or on the remote workstation, and then use VFSA drives to concurrently access the files from multiple instances of SoftWindows running on the same or multiple UNIX workstations.

- SoftWindows will typically only see the remote UNIX workstation's devices and therefore cannot directly use the local workstation devices, such as floppy drives, CD-ROM drives, and comms ports.
- Only one user can access a server device at a time.

Memory considerations

Physical memory

The recommended amount of memory for workstations running SoftWindows is 64 Mbytes or more. It will run on 48 Mbyte machines but performance may be suboptimal.

PC memory

To run Windows applications under SoftWindows the recommended amount of PC memory is 16 Mbytes, as on a real PC. Certain resource-intensive applications may require more memory for optimum performance.

Allocating too much PC memory can reduce performance in some circumstances, depending on the amount of physical memory in the machine, and the other processes running on the machine, since swapping may result. We recommend that you increase the PC memory gradually until any resulting increase in performance levels off. Adding more PC memory after this point could reduce performance.

On 48 Mbyte machines, performance may be improved if you reduce the PC memory below the default of 16 Mbytes.

CPU memory

SoftWindows uses host memory to support the Pentium emulation in addition to the memory used to emulate PC memory. It is possible that adjusting the amount of host memory dedicated to the Pentium emulation can improve performance. By default, the Pentium emulation is allocated the maximum value of 8 Mbytes, or 1024 code buffers. You can change this by setting the environment variable MaxCodeBuffers to a minimum of 3327 (25 Mbytes of memory).

Windows versus UNIX swapping

The Pentium supports paging, allowing pages of data from memory to be swapped to secondary storage. If your host machine has limited memory and you know that you are going to have to endure a certain amount of swapping, you have the choice of either getting Microsoft Windows to handle its own swapping (by setting a lower amount of PC memory) or allocating enough PC memory to SoftWindows to alleviate this. In the second case, the host machine handles the swapping.

Diskless nodes

Although a diskless node has its own memory, it uses the server for its operating system. Also, because the node's disk is shared with the server, paging is carried out by the server, not by the diskless node. This will have a compounded effect if a user tries to run more than two versions of SoftWindows at a time. Refer to "Physical memory" on page 78 for more information.

The configuration of the user's network also affects the use of SoftWindows on a diskless node since SoftWindows will need to access the network for everything; this could cause a degradation in performance, particularly if the network is slow and unreliable.

CPU and memory usage – multiple SoftWindows sessions

When SoftWindows is actively running a PC or Windows application it will attempt to use 100% of the UNIX host's available CPU – just as the application uses 100% of a real PC's Pentium CPU cycles.

If you run several SoftWindows sessions concurrently on the same machine, they will share the host's CPU resource. For example, if two SoftWindows sessions are running simultaneously on the same machine, each will use at most 50% of the host CPU resource; they will therefore run at half speed when they are both active.

Note: SoftWindows will use its idle detect feature when a session becomes inactive. This means that if you have two sessions on one machine, and one is idle, then the other will run at full speed. This is achieved by means of the SoftWindows WinIdle utility; refer to "WinIdle."

Display considerations

Local display versus remote display

The performance of SoftWindows is reduced when it is displayed remotely because display data and input from the keyboard and mouse has to be transferred over the network.

A 256-color bitmap can be quite sizeable in terms of the amount of data which must be transmitted. A remote display may also affect the networking component of SoftWindows since, for particular protocols on particular platforms, SoftWindows networking sees all the packets that the host machine sends, including any packets resulting from having a remote X display.

Graphics cards

For best performance use an 8-bit graphics card.

There may also be an issue when using Microsoft Windows with 256 or 16 colors. There have been some instances of a graphics card having a problem with one color setting while working fine with the other. An example of this is the Sparc ZX card. In tests, SoftWindows ran slower when in 16-color mode than in 256-color mode. It should be noted that the results were very host-specific.

Another option which produces a performance improvement is the use of the *-backing_store* option with SoftWindows. This option makes use of the backing store facility if it exists on the user's machine.

If, while using the *-backing_store* option, SoftWindows suddenly stops refreshing the screen, then the problem may be the X server. If the server runs out of memory, the backing store facility simply disappears. If SoftWindows has not refreshed the window since you launched it, you may have to restart your X server with an option enabling the backing store feature.

SoftWindows screen

The larger the SoftWindows screen size selected, the slower SoftWindows will tend to run.

If the application displays larger bitmaps as a result of a larger screen size, this results in much more data being sent to the X server, which can degrade performance.

If the window is too small, the application does its own clipping within the emulation. For example, too small a window size can cause scroll bars to be displayed. This can also impact performance.

You may wish to select various screen sizes to see which best suits your application. Beware of having screen sizes which occupy the entire X display or even are partially off screen, since this is known to severely degrade performance with certain window managers because of the extra clipping work required on each X request.

X terminals

SoftWindows can be run on an X terminal connected to a UNIX server. Note, however, that the areas of concern highlighted in the “Local display versus remote display” and “Physical memory” sections apply to the use of SoftWindows on an X terminal.

Running an application on an X terminal uses up some of the resources of the UNIX server to which it is connected.

Also note that Windows 95 performs numerous offscreen bitmap operations which SoftWindows delegates to the X server, and this uses the local X terminal memory. The amount of physical memory an X terminal has can impact these types of operations. With the X server using some of this memory as well, you may need to add more physical memory to the X terminal. The amount each terminal requires is very host-specific, and also depends upon the X server being used.

Other factors

VFSA filename mapping

For VFSA drives where the user knows that all files are DOS/Windows files in standard 8.3 format, VFSA file access can be improved in certain circumstances. For example, if you are accessing an OS/2 file system from Windows 95, use Case Insensitive as your preferred case. For more information refer to “Mapping filenames on an VFSA drive.” If you are accessing an OS/2 file system from Windows 3.11, use the *NET USE /CS* command to disable the filename mapping facility, since it would be unnecessary on an 8.3 file system. For more information refer to “NET USE.”

Multiprocessor machines

If SoftWindows is being run on a multiprocessor host, a performance improvement may be seen by ensuring that SoftWindows runs on a different processor than the X server. If the host is to run multiple SoftWindows sessions, it would be best to run each session on a different processor if sufficient processors are available.

Busy networks

Due to the mechanism used by SoftWindows to provide PC LAN connectivity, users may experience a slight degradation of SoftWindows network performance on busy networks. Where possible, SoftWindows PC networking drivers are passed only the network packets required by the PC network client software. However, if the SoftWindows user requires UNIX connectivity using TCP/IP, the SoftWindows networking drivers will also receive the host's own TCP/IP traffic which must be rejected. This extra filtering can cause a slight increase in workload on the PC emulation.

It is recommended that when SoftWindows-based TCP/IP client software is used, the SoftWindows session should not be displayed on a remote display. Displaying remotely increases the overall network load on the PC-based TCP/IP stack.

In general, the SoftWindows networking drivers are passed the same amount of information as would be passed to a real networked PC and are subject to the same environmental conditions. Extra CPU resources or memory will not solve problems caused by a poorly structured, badly designed, or incorrectly routed local area network.

SmartDrive

SmartDrive causes a performance degradation of 2%–5%, and so it is recommended that you do not enable it.

SmartCopy

The SmartCopy utility can cause a delay when switching to the SoftWindows window from another X application after selecting a large amount of data due to the time taken to copy the data selected in the X application to the Microsoft Windows clipboard. Depending on the amount of data involved, this can take a second or two. It is highly recommended that you leave SmartCopy running at all times.

WinIdle

Microsoft Windows applications that pause between tasks can activate the SoftWindows *WinIdle* utility, causing SoftWindows to go idle, seemingly reducing performance and slowing down the application. If this causes problems, remove *WinIdle* from the Windows Startup folder.

Advanced installation options

Running SoftWindows on a second workstation

If you want to make SoftWindows available to additional workstations, either install SoftWindows on each workstation or remotely mount the original SoftWindows installation on each workstation.

In either case you need a license for each copy of SoftWindows you want to run concurrently.

Mounting a copy of SoftWindows

To mount a copy of SoftWindows on a second workstation, proceed as follows:

1. Mount or link the remote *\$SWINHOME* to a local *\$SWINHOME*.

For example, using an NFS mount type the following commands as root at the UNIX prompt on the second host:

```
mkdir $SWINHOME
```

```
mount sourcemachine:install $SWINHOME
```

where *sourcemachine* is the name of the workstation where SoftWindows was physically installed, and *\$SWINHOME* is the SoftWindows installation directory.

Alternatively, you can use automounter, assuming the following line has been included in the automounter mapping file on the second host:

```
/net -hosts
```

by typing the following command at the UNIX prompt on the second host:

```
ln -s /hosts/sourcemachine/install $SWINHOME
```

where *sourcemachine* is the name of the workstation from which you are installing and *\$SWINHOME* is the SoftWindows installation directory.

2. Run SoftWindows in the usual way by typing, for example:

```
$SWINHOME/bin/swin
```

Installing SoftWindows on a second workstation

To install SoftWindows on a second workstation, install SoftWindows as normal, but remove the `$SWINHOME/FLEXlm/license.dat` file if present. Either:

- Edit the user's `.cshrc`, `.login`, or `.profile` file to include a line that specifies a valid license file in the network.

For example, in the C shell, add the following single line to `.cshrc`:

```
setenv LM_LICENSE_FILE /hosts/machine/$SWINHOME/FLEXlm/license.dat
```

where `$SWINHOME` is the SoftWindows installation directory.

or:

- Link the primary license file to the secondary installation. When a link is created, new licenses can be accessed from SoftWindows without having to copy the license file around the network.

For example, enter the following command (all on one line):

```
ln -s /hosts/machine/$SWINHOME/FLEXlm/license.dat  
$SWINHOME/FLEXlm/license.dat
```

where `$SWINHOME` is the SoftWindows installation directory.

Creating Symbolic links to the hard disk data file

In a multi-user environment, installing the hard disk data file (needed whenever users create a new hard disk) locally on each workstation consumes a large amount of disk space. As an alternative to doing this, you might consider copying the file onto a network drive. You can then create symbolic links to it on each workstation in `$SWINHOME`.

For example, executing the following UNIX command would create the symbolic link file `sys.diskdata` in `$SWINHOME` assuming the `WIN95.DAT` file has been copied from the second installation CD-ROM (CD2) to `/net/srvr/mountpt`.

```
ln -s /hosts/srvr/mountpt/WIN95.DAT $SWINHOME/sys.diskdata
```

Running SoftWindows in secure mode

SoftWindows can be configured to run in a secure mode, which is designed to allow the system administrator to configure an installation so that users have access only to specific PC applications and cannot change the configuration of SoftWindows itself.

Secure mode provides the following features:

- Users run a standard configuration of SoftWindows and cannot modify that configuration.
- The SoftWindows menus are disabled.
- SoftWindows is prevented from booting from a floppy disk in drive **A:**. If configured, drive **A:** can still be used for normal file storage operations by Windows and MS-DOS programs.
- The MS-DOS boot modifier keys, **5**, **8**, and **S** are disabled so that users cannot modify the boot sequence.
- The MS-DOS control key combinations, **cC**, **cB**, and **cAD** are disabled so that users cannot force an abnormal exit from application programs.
- SoftWindows can be set up so that SoftWindows terminates when the user exits from an application.

To run SoftWindows in secure mode

This section describes the recommended procedure for setting up a user to run in the secure mode.

1. Log in as the user, and start SoftWindows to set up a hard disk file and any required VFSA drives to run the required PC application.
2. Add the following command to the user's *AUTOEXEC.BAT* file:
C:\INSIGNIA\SECURITY.COM
3. Exit from SoftWindows and save the configuration.
4. Log in as root and use a text editor, such as *vi*, to edit the SoftWindows system configuration file *\$SWINHOME/sys.swinconfig* to use the hard disk containing the PC application as set up by the first step, and with any other configuration settings required (communications port, floppy device, display size, and so on).

5. After editing *sys.swinconfig*, ensure that it is owned by root and has the SUID bit set. If necessary, log in as root and cd to the SoftWindows installation directory. Then enter the commands:

```
chown root sys.swinconfig
```

```
chmod 4444 sys.swinconfig
```

You may find it useful to refer to the configuration previously saved to the user's configuration file, *\$HOME/.swinconfig*.

You cannot simply copy the user's configuration file over the system configuration file, because the system configuration includes some additional lines.

For more information about the system configuration file refer to Chapter 7, "SoftWindows configuration."

6. Carry out any further configuration of the UNIX system which is required to run the PC application securely.

This may involve changing ownership or permissions of files or directories in the user's environment or which are used through VFSA drives.

For security purposes you may wish to restrict access to user files run during the UNIX login process and configure the user's account to use a restricted shell.

7. Ensure that there is not a *.swinconfig* file in the user's home directory, and that *SWINHOME* and other environment variables are set appropriately to use SoftWindows when the user logs in.

8. Log in as the user, and check that the PC application runs as required.

When SoftWindows boots, it will notify you that the user does not have a configuration file. At this stage the SoftWindows menus are still enabled, so you can check the configuration. Make a note of any configuration changes that are required so that they can be added to the system configuration file.

9. Edit the SoftWindows system configuration file *\$SWINHOME/sys.swinconfig*, and change the configuration entry *SECURE* from *No* to *Yes*.

10. Ensure that *\$SWINHOME/sys.swinconfig* is owned by root and has the SUID bit set.

This is necessary because editing the file manually may clear the SUID bit. If necessary, log in as root, and from the *\$SWINHOME* directory enter the commands:

```
chown root sys.swinconfig
```

```
chmod 4444 sys.swinconfig
```

The user will now only be able to run SoftWindows in secure mode.

Additional security features

For maximum security, it is recommended that SoftWindows be installed on the workstation on which it is to be executed. Running SoftWindows across an NFS mount to another workstation may not be as secure in some situations as in others.

If the PC application you are using can be exited by the user, you may find it useful to run it from a batch file that includes a reference to the utility `C:\INSIGNIA\EXITSWIN.COM`, which causes SoftWindows to exit.

For maximum security, it is also recommended that configuration entries in `$SWINHOMESYS.swinconfig` should not use environment variables (such as `$HOME`) to locate hard disk files, VFSA directories, and so on. Otherwise the user could set the environment variable to use an alternate directory.

You may also wish to restrict users from viewing the administrator's on-line help. To do this, change the link from the file `$SWINHOMEHYPERHELP/swinusr.hlp` to the file `$SWINHOMEHYPERHELP/swinsel.hlp` to point to the file `$SWINHOMEHYPERHELP/swinu.hlp`. This will mean that any user not logged on as root will always see the user's help when selecting help, rather than having a choice between the user's help and administrator's help.

Networking with SoftWindows

SoftWindows includes network drivers which enable you to share files with other PCs, or run multi-user applications on a network.

This chapter gives full details of how to set up networking within Windows 95.

Introduction

SoftWindows offers you the same network functionality as any PC, enabling you to install a wide variety of PC networking packages. This is achieved using network drivers which operate over Ethernet networks.

This chapter begins with a brief description of the network interfaces supported within SoftWindows followed by instructions on how to install network clients within Windows 95.

Network Interfaces

In a PC networking environment, the operating system does not communicate directly with the network card itself, but through a software interface called a network driver. Modern network drivers and communication protocols are written to common interface standards, allowing multiple protocol stacks to be used with any network interface driver written to the same standard.

Currently the most popular standards are the Network Driver Interface Specification (NDIS, developed by Microsoft and 3COM) and Open DataLink Interface (ODI, developed by Novell and Apple).

Another driver standard is Winsock, which is one of the most popular PC network interfaces for TCP/IP applications.

SoftWindows is supplied with the following network drivers for Ethernet networks:

- NDIS, V3.1 miniport, Windows 95 only.
- ODI, 16-bit real mode.
- Winsock, V1.1, 16-bit and 32-bit.

All SoftWindows networking drivers are stored in the C:\INSIGNIA directory, and have the following filenames:

Table 10-1 Network Driver Filenames

Network Driver	Filename
Ethernet NDIS	IETH.SYS
Ethernet ODI	ETHERSPC.COM
Winsock (16-bit)	WINSOCK.DLL
Winsock (32-bit)	WSOCK32.DLL

Since the SoftWindows ODI and NDIS drivers access the same physical network interface they cannot be used simultaneously.

Networking with Windows 95

The following section describes the configuration of networking within Windows 95.

Windows 95 can be configured to use either the SoftWindows NDIS or ODI network drivers. It is recommended that the NDIS drivers are used where possible as they are Windows 95 specific and offer the best performance. Note also that some third-party clients and protocol stacks must be installed via NDIS drivers. The configuration of the SoftWindows NDIS and ODI drivers are outlined in the following sections.

SoftWindows is supplied with both 16- and 32-bit Winsock (1.1) support pre-installed. This allows any Winsock compliant application to be used without re-configuring Windows 95. If access to Local Area Network services is required, Windows 95 must be re-configured to access the host's network device via either the SoftWindows NDIS or ODI drivers.

SoftWindows NDIS drivers

To use the SoftWindows NDIS driver with the standard Microsoft Windows 95 clients, follow the instructions below. To use the NDIS driver with other Windows 95 network clients, following the application installation instructions, installing the SoftWindows NDIS driver as described below when required:

Note: Ensure that you have a Windows 95 CD or access to the Windows 95 setup files available to SoftWindows before starting this procedure.

1. Click the *Start* button, point to *Settings*, and then click *Control Panel*.
2. Double-click the *Network* icon in the *Control Panel* folder.
The *Network* dialog box is displayed.
3. If any existing drivers are displayed, select them and click *Remove*.
4. Click *Add....*
5. Select *Adapter* and click *Add....*

A number of network adapter cards will be presented.

6. Select *Insignia Solutions SoftWindows plc Ethernet*, and click *OK*.

The *Network* dialog box should now include the following items:

- *Client for Microsoft Networks*
- *Client for NetWare Networks*
- *SoftWindows Ethernet Driver*
- *IPX/SPS-compatible Protocol*
- *NetBEUI*

Windows 95 adds the *IPX/SPX* and *NetBEUI* protocols and the *Microsoft* and *NetWare* clients by default.

The *SoftWindows* network driver can be configured to be either *NDIS* (default) or *ODI*. To ensure that the *NDIS* driver has been chosen, select the *SoftWindows Network Driver* and click *Properties*.

Ensure that *Enhanced Mode (32-bit and 16-bit) NDIS driver* is selected.

7. Click *OK* to return to the *Network* dialog box.
8. Add any additional protocols and clients you require.

9. Remove those protocols and clients you do not need.
10. Once you are happy with the clients and protocols you have configured, select the *Identification* tab.

It is important that each Windows 95 machine has a unique Computer Name.

1. Select a unique Computer name.
2. Select the Workgroup you wish to be a member of.
3. Select a Computer Description for SoftWindows.

Remember that other users identify your SoftWindows installation from these settings. An informative Computer name and Computer Description can help when attempting to share network resources.

4. Once you are sure that the configuration is complete select *OK*.
5. When a dialog appears asking you to confirm the resource allocation for the driver, accept the default (IRQ 10), and click *OK*.

Windows 95 will now download the appropriate software and drivers from your Windows 95 CD or setup files. Ensure you have these available. You will be prompted to supply the location of the SoftWindows network drivers, these can be found in the C:\INSIGNIA directory.

6. When asked whether you want to restart Windows 95 click *Yes*.

After restarting Windows 95, double-click the Network Neighborhood icon to list the servers and machines that are visible to your computer. To view all the network resources available to your machine, double-click the Entire Network icon.

SoftWindows ODI drivers

Windows 95 may also be configured to use the SoftWindows ODI drivers, although this is not the recommended solution. The ODI drivers are not supported; it is recommended that you use the NDIS drivers.

Note: TurboStart is not available if you are using ODI networking with Windows 95.

1. Follow the steps described in the “SoftWindows NDIS drivers” section but select the Real Mode (16 bit) ODI driver from the list of supported the drivers in the SoftWindows Network Driver Properties dialog box.
2. When asked whether you want to restart Windows 95 click *No*.

Even though Windows 95 has now been set up as required the SoftWindows ODI driver needs to be configured to support the protocols and clients selected.

The SoftWindows ODI drivers are configured through the `C:\WINDOWS\NET.CFG` file. By default this is set to support Ethernet, with the frame types set to `ETHERNET_802.2` for Novell NetWare and Microsoft Networking, that is, the same default protocols as those chosen by Windows 95 during the network setup.

If your network has different characteristics you will need to edit the `NET.CFG` file to select the appropriate options. To change the options, comment out the current setting by inserting a semicolon in front of the line, and remove the semicolons from the lines you require. See the “Configuring ODI drivers” for more details.

Configuring SoftWindows 4.0 for networking to other PC network clients

Follow the steps below to configure and load the SoftWindows ODI driver:

1. Edit the system's `C:\AUTOEXEC.BAT` file by adding the following at the end:

```
C:\WINDOWS\LSL.COM  
C:\WINDOWS\ETHERSPC.COM
```

2. Edit the ODI system file C:\WINDOWS\NET.CFG to support the required clients. It is pre-configured to support NetWare and Microsoft clients.

TCP/IP support requires the following change.

- Open the *net.cfg* file and look for this section

```
; SoftWindows' Ethernet configuration.  
; The following section allows Windows 95 to support Microsoft  
Networking  
; (via NetBEUI) and Novell NetWare (via IPX).  
LINK DRIVER ETHERSPC  
    FRAME Ethernet_802.2  
    FRAME Ethernet_II  
    FRAME Ethernet_SNAP  
    FRAME Ethernet_802.3  
    PROTOCOL IPX E0 Ethernet_802.2  
    PROTOCOL SMB F0 Ethernet_802.2
```

- After locating the file you must add the following threelines to the protocol list:

```
PROTOCOL IP 800 ETHERNET_II  
PROTOCOL ARP 806 ETHERNET_II  
MAXPACKET SIZE 1514
```

- The final altered section looks like the following:

```
; SoftWindows' Ethernet configuration.  
; The following section allows Windows 95 to support Microsoft  
Networking  
; (via NetBEUI) and Novell NetWare (via IPX).  
LINK DRIVER ETHERSPC  
    FRAME Ethernet_802.2  
    FRAME Ethernet_II  
    FRAME Ethernet_SNAP  
    FRAME Ethernet_802.3  
    PROTOCOL IPX E0 Ethernet_802.2  
    PROTOCOL SMB F0 Ethernet_802.2  
    PROTOCOL IP 800 ETHERNET_II  
    PROTOCOL ARP 806 ETHERNET_II  
    MAX PACKET SIZE 1514
```

3. Save this file.
4. Restart SoftWindows.

This step is vital to your success; if you do not restart SoftWindows at this time networking will not work.

5. Once SoftWindows has started, click the Start button, select Settings, then click Control Panel.
6. Double-click the Network icon in the Control Panel folder. The Network dialog box is displayed. Assuming no networking was previously configured, the network dialog box shows that no components are installed.
7. Click Add... A dialog box appears, which allows you to configure clients, adapters, protocols, and services.
8. Choose Adapter, and click Add... You will be presented with a range of alternative network adapters. Ignore these drivers; they will not work and are there to maintain 100% compatibility.
9. Under Manufacturers, select (detected net drivers).
10. Select Existing ODI Driver from the Network Adapters list, and click OK to add it.
If this option is not present, ensure that SoftWindows was able to initialize the network adapter at start-up.
11. The Network dialog box should now list the driver you selected, and associated clients and protocols (for example, IPX/SPX-compatible protocol and NetBEUI). Remove those clients and protocols you do not need.
12. Add those clients or protocols you want loaded (for example, the Microsoft TCP/IP protocol).
13. For each protocol and client, click Properties to ensure the configuration suits your environment.
14. When you are happy with the configuration, click OK to confirm the changes you have made.
15. Follow any system prompts and restart Windows 95.
16. SoftWindows now loads the needed drivers from a compressed version of the CD located on your hard drive.
 - There is often a error stating that the file lsl.com on Novell Netware Dos driver disk could not be found. To rectify this situation, enter `c:\nwclient` as the path.

Advanced Topics

The following section should be used for reference.

Configuring NDIS drivers

The Windows 95 registry holds various configuration settings for the SoftWindows NDIS drivers. Although these settings can be modified by editing the registry, the preferred approach is by the Network icon within the Windows 95 Control Panel. The network settings can be viewed by performing the following steps:

1. Click the *Start* button, point to *Settings*, and then click *Control Panel*.
2. Double-click the *Network* icon in the *Control Panel* folder.
3. To access the SoftWindows Network driver's Advanced settings select the SoftWindows Network driver and click on *Properties*.
4. Select the *Advanced* tab to view the NDIS driver's settings:
5. The following Advanced settings are defined:

NDIS Ethernet Driver Properties:

- On-the-fly Packet Filtering
- Protocol Override 1
- Protocol Override 2
- Protocol Override 3
- Protocol Override 4
- Protocol Override 5

On-The-Fly packet filtering

In normal operation the SoftWindows NDIS drivers filter received packets on-the-fly. That is, they only receive packets of protocol types which it has previously transmitted. In some circumstances this could cause a slight degradation in performance and the functionality of the NDIS drivers can be changed to disable this on-the-fly filtering technique. Disabling this functionality can stop network packets being received by Windows 95 if care is not taken.

If On-The-Fly packet filtering is disabled Valid Protocol Overrides *MUST* be supplied.

Protocol Override 1 - 5

Five Protocol Override settings are provided. These force the SoftWindows NDIS drivers to enable the selected protocol types. The following table shows how to enable specific frame/protocol types:

Table 10-2 NDIS Driver Protocol Override Settings

Frame Type	Value format	Example
Ethernet_II	<i>xxx</i>	0806
Ethernet_802.2	<i>xx</i>	F0
Ethernet_802.3	FF	FF
Ethernet_SNAP	<i>AAxxxxx</i>	AA008137

Where 'x' represents a Hex digit.

Note that ALL protocols must be added. To enable TCP/IP you must enable both IP (0800) and ARP (0806). It is valid to have On-The-Fly packet filtering enabled whilst protocol overrides are defined. They are simply ignored.

Configuring ODI drivers

The ODI system is configured through a single file: *NET.CFG*.

The *NET.CFG* file is divided up into sections, each of which provides parameters to configure a different part of the ODI system. Each section of the file begins with a section heading at the start of the line, followed by a series of tab-indented configuration options under the section heading.

The following example shows a simple *NET.CFG* file:

```
LINK SUPPORT
    BUFFERS 8 1500
    MEMPOOL 8192
LINK DRIVER ETHERSPC
    FRAME ETHERNET_II
    PROTOCOL IPX 8137 ETHERNET_II
```

These sections are described in detail below.

Link Support

The `LINK SUPPORT` section of the *NET.CFG* file is used to configure the Open Data-link Interface Link Support Layer (LSL.COM). This section is only needed when protocols require a non default configuration.

Link Driver

The `LINK DRIVER` section is the most important part of the *NET.CFG* file for configuring SoftWindows. The options set in this section govern the interface between the driver and the rest of the system, the protocols registered with the network interface, and the format of packets transmitted and received. There are also numerous other configuration options associated with the network interface card, but most of these are not relevant to SoftWindows.

The following options are the most important for SoftWindows:

FRAME

Syntax: *FRAME frame-type*

This configuration option enables a particular frame type.

PROTOCOL

Syntax: *PROTOCOL name protocolID frame-type*

This configuration option enables a particular protocol to be used with a particular frame type. The SoftWindows ODI driver will only receive network packets for those protocols enabled within the *NET.CFG* file.

MAX PACKET SIZE

Syntax: *MAXPACKETSIZE value*

Some platforms limit the size of packets which can be transmitted. This option is only offered to resolve any platform-specific limitations which may occur in the future.

The default sizes are shown in Table 10-3.

Table 10-3 Maximum Packet Sizes

Network	Default Max Packet Size
Ethernet	1514

Example

A sample LINK DRIVER section is as follows:

```
LINK DRIVER ETHERSPC
    FRAME ETHERNET_802.2
    FRAME ETHERNET_II
    FRAME ETHERNET_802.3
    FRAME ETHERNET_SNAP
    PROTOCOL IPX 8137 ETHERNET_II
```

The FRAME lines in this LINK DRIVER section allow all four Ethernet frame types to be used with the driver. It is recommended that you always include all frame types in the LINK DRIVER section to allow the driver to transmit and receive frames in any of the common hardware packet formats. Note that the order of the lines is not significant. A configuration such as this prevents any FRAME and PROTOCOL mismatches occurring, and also makes configuring both ODI and NDIS (over ODI via the ODINSUP shim) identical.

The MAX PACKET SIZE option limits the size of any packets being transmitted and is only provided to solve platform-specific implementations in which the host is not able to transmit full size raw packets.

Since the SoftWindows ODI drivers (ETHERSPC) and the other Novell ODI components all obtain their configuration data from the NET.CFG file, it is important that they all reference the same *NET.CFG* file. It is recommended that all the ODI components are loaded from the directory which contains the *NET.CFG* file, usually

```
C:\NWCLIENT
```

For example:

```
CD\NWCLIENT
LSL
ETHERSPC
IPXODI
VLM
```

ODI Frame types

The table below provides information on the FRAME types and PROTOCOL entries required in the NET.CFG file for common Network Clients and SoftWindows.

Windows 95 / Microsoft Lan Manager / Windows For Workgroups

```
PROTOCOL SMB F0 ETHERNET_802.2
```

Novell NetWare

```
PROTOCOL IPX E0 ETHERNET_802.2
PROTOCOL IPX 8137 ETHERNET_II
PROTOCOL IPX 8137 ETHERNET_SNAP
PROTOCOL IPX 0 ETHERNET_802.3
```

Novell's Protocol Burst support

Although by default this feature is disabled, it is possible to increase the performance of the NetWare 4 client within SoftWindows by enabling Novell's Protocol Burst support for use with the SoftWindows ODI driver. This should only be enabled when accessing NetWare 4 servers via the NetWare 4 client as no increase in performance will be seen in other circumstances.

To enable Protocol Burst support the SoftWindows NET.CFG file must be edited. Remove the ; (semi-colon) at the beginning of the following line:

```
; MAX IPG = 1
```

Change the value of *PB BUFFERS* from 0 to 7.

Protocol Burst support will now be enabled whenever the NetWare 4 VLM client is loaded.

TCP/IP Connectivity

```
PROTOCOL IP 800 ETHERNET_IIPROTOCOL ARP 806 ETHERNET_II
```

Banyan VINES

```
PROTOCOL VINES BAD ETHERNET_II
```

Where two or more protocols of the same frame type are provided for the network client, all must be present in the NET.CFG file for the client to work correctly. For example, for the Microsoft network client to work over TCP/IP, and for access to NetWare servers to be enabled, the following must be defined in the Ethernet section of the NET.CFG file:

```
LINK DRIVER ETHERSPC  
FRAME ETHERNET_II  
PROTOCOL IP 800 ETHERNET_II  
PROTOCOL ARP 806 ETHERNET_II  
PROTOCOL IPX 8137 ETHERNET_II
```

Troubleshooting ODI

Link Support Layer

No problems should be encountered when loading the Link Support Layer. If an error does occur, the most likely cause is an incorrect entry in the LINK SUPPORT section of the *NET.CFG* file.

The ODI driver

Several problems could cause the SoftWindows ODI driver to report a failure at load time. The following are common faults and solutions:

ODI driver cannot find the host's network adapter

The message shown below indicates that the SoftWindows ODI driver has failed to initialize or find the host's network device:

```
C:\NWCLIENT>etherspc
Insignia Ethernet MLID v2.00E (950908).
(C) Copyright 1991-1995 Insignia Solutions Inc. All Rights Reserved.
IRQ 10, Node Address 800690895E2 L
Max Frame 1514 bytes, Line Speed 10 Mbps, Bus ID 0
Board 1, Frame ETHERNET_802.2, LSB Mode
Board 2, Frame ETHERNET_II, LSB Mode
Board 3, Frame ETHERNET_SNAP, LSB Mode
Board 4, Frame ETHERNET_802.3, LSB Mode
Could not find a host Ethernet card.
ETHERSPC-DOS-6: The adapter did not initialize. ETHERSPC did not load.
```

The SoftWindows ODI driver has failed to initialize or find the host's network device. Ensure that:

- The specified topology (Ethernet) is supported on your platform.
- The SoftWindows executable is owned by root, group sys, and has the 's' bit set.

ODI driver is loaded twice

The second attempt at loading the ODI driver will produce error output similar to the following:

```
C:\NWCLIENT>etherspc
Insignia Ethernet MLID v2.00E (950908).
C) Copyright 1991-1995 Insignia Solutions Inc. All Rights Reserved.
ETHERSPC-DOS-7: You need another ETHERSPC driver section in the
NET.CFG file in order to load the LAN driver again.
```

The SoftWindows ODI drivers can only be loaded once. If you need to reload the ODI driver simply unload the previous instance first with the command:

```
ETHERSPC U
```

SoftWindows Winsock drivers

SoftWindows is supplied with Winsock 1.1 compliant drivers. SoftWindows will run Winsock-based applications without any modification. No configuration is required within the Windows environment. Unlike third-party Winsock drivers, which require a PC-based TCP/IP stack, the SoftWindows Winsock drivers use the host's TCP/IP stack for all network activity. This not only removes the need for a third-party PC-based TCP/IP stack, but also reduces the overall amount of memory used within SoftWindows to provide Winsock support.

The SoftWindows Winsock drivers are pre-installed within the Windows system and are ready to use. Copies are also provided in the C:\INSIGNIA directory. Note that since the SoftWindows Winsock drivers use the host TCP/IP protocol stack they both share the same IP address.

The installation of third-party TCP/IP protocol stacks replace the SoftWindows Winsock drivers and will require full configuration (Unique IP Address etc.). To restore the SoftWindows Winsock drivers simply copy them from the C:\INSIGNIA directory and overwrite those in C:\WINDOWS and C:\WINDOWS\SYSTEM.

SoftWindows Winsock drivers can be used by any Winsock-compliant applications.

Some networking applications require and expect a full TCP/IP protocol stack to be installed. The SoftWindows Winsock drivers cannot be used with these applications. The Microsoft TCP/IP protocol stack and Winsock DLLs must be installed for these applications to work.

Configuration Issues

TCP/IP Networking

When using TCP/IP-based clients within SoftWindows it is advisable to run SoftWindows on machines with just one network card installed. If more than one card is installed within the machine, the host's operating system may handle the TCP/IP packets destined for SoftWindows as packets to be *routed*. This will result in a vast degradation in performance and is not an encouraged configuration.

When running multiple SoftWindows sessions on the same machine, only one SoftWindows session will support networking via the SoftWindows ODI or NDIS drivers.

Networking Details for Microsoft TCP/IP

If you decide to install the SoftWindows NDIS or ODI driver and add the Microsoft TCP/IP protocol, then the Microsoft Winsock libraries will be taken from the Windows 95 setup files and placed in the *C:\WINDOWS* and *C:\WINDOWS\SYSTEM* directories. (The SoftWindows Winsock DLL files are still present in the *C:\INSIGNIA* directory). You can use one set of DLL files or the other, but not both.

The application or functionality you require determines which winsock drivers should be installed.

If you need a FULL TCP/IP stack (for example, to map drives to NT servers, Microsoft Exchange, or applications which use Microsoft extensions), then you should be using the Microsoft Winsock DLLs.

If you don't want to use Microsoft Winsock extensions, or your application is a true winsock application—the application doesn't expect and use the Microsoft full TCP/IP stack—for example, MicrosoftIE, Netscape, or Telnet, then you should use the SoftWindows Winsocks, as they offer better performance with less configuration.

When using the Microsoft TCP/IP stack you **MUST** use a unique IP Address.

It doesn't make sense to use the SoftWindows Winsocks above the Microsoft TCP/IP stack.

Auto Freeze

Do not select Auto Freeze within SoftWindows if you are using networking. Using Auto Freeze in such an environment is like disconnecting the network cable from the machine. If you do use the Auto Freeze option, you will find that your connections to servers and other network facilities have been disconnected when you reenter SoftWindows.

Remote Display

If SoftWindows is configured to be a TCP/IP client, avoid using a remote display. Using a remote display leads to increased TCP/IP traffic generated by X Windows which SoftWindows will receive and must then filter.

IRQ level

Some network client software needs to know the interrupt number of the ODI driver during installation and configuration. SoftWindows ODI and NDIS drivers uses IRQ 10 (decimal).

Troubleshooting

If you can't see any other PCs in your Network Neighborhood, there are several reasons why it might not be working:

- The Silicon Graphics system is not properly connected to the network. A quick test is to ping the Silicon Graphics system's IP address from a known working PC or Workstation.
- You have not chosen a common Protocol. Right click the Network Neighborhood icon and choose Properties from the drop down menu, verify that the protocol used on your PC network is listed (most likely NetBEUI), if not add it and check the Properties.
- You did not follow all the instructions in the section "Configuring SoftWindows 4.0 for networking to other PC network clients."

If you can't get the *ping* or *ftp* commands to work in SoftWindows:

You must use a unique IP address when you have an full TCP/IP protocol stack within SoftWindows (be that DOS, Windows, or Windows95).

See Table 10-4 for a chart of the various configuration combinations that work for these commands when running SoftWindows.

Table 10-4 Valid *ftp*, *telnet* and *ping* Configurations

Configuration/Test	Microsoft ping	Microsoft telnet	Microsoft ftp	Notes
No networking installed (default)	Invalid configuration	WORKS	Invalid configuration	SoftWindows Winsocks (default). No Microsoft Protocol stack.
Install Microsoft TCP/IP	WORKS	WORKS	WORKS	Microsoft Winsocks and Protocol stack
to SoftWindows localhost (itself)	WORKS	not a possible operation	not a possible operation	Microsoft Winsocks and Protocol stack
to my IRIX localhost	Invalid configuration	Invalid configuration	Invalid configuration	IRIX snoop doesn't support this
to another IRIX in subnet	WORKS	WORKS	WORKS	

Troubleshooting

By default, no networking user errors are displayed by SoftWindows. However, if you are encountering networking problems, you can enable error reporting in one of the following two ways:

Command-line option

To enable network error reporting from the command line include the command-line option `-snerror` when running SoftWindows.

Environment variable

Alternatively, networking error reporting can be enabled by setting the `SNERROR` environment variable to one of the following values:

- `SNERROR x` - Network errors are displayed in an error dialog box.
- `SNERROR console` - Network errors are output to the system console.

Supported Topologies

SoftWindows supports Ethernet networks. However due to device limitations several network devices cannot support all the features required by SoftWindows. The following tables list known configurations:

Table 10-5 Supported Frame Types

Frame Type	Supported
Ethernet_802.2	YES
Ethernet_II	YES
Ethernet_SNAP	YES
Ethernet_802.3	YES

Table 10-6 Supported Client Configurations

Client	Protocol	Ethernet Support
Windows95	Microsoft-IPX	YES
Windows95	NetBEUI	YES
Windows95	TCP/IP	YES
Winsock	TCP/IP	YES
Novell NetWare	IPX	YES
Microsoft NT	NetBEUI	YES
Microsoft NT	TCP/IP	YES
Banyan VINES	VINES	YES
UNIX Connectivity	TCP/IP	YES

System patches may have to be applied to the host OS in order to achieve these results. See the Operating System Patches section for such information.

Supported Network Devices

To use a network card other than the default selected by SoftWindows:

1. Choose Network from the Options menu to display the Network Configuration dialog box.

The dialog lists all available network cards on your UNIX machine, with the default card selected.

2. Click the check box next to the network card you want SoftWindows to use.

Windows licensing and MS-DOS applications

Licensing Windows and MS-DOS applications

SoftWindows includes a built-in licensing system which allows you to set up licenses for third-party 16-bit Windows and MS-DOS applications. You can use this to monitor or enforce the licensing restrictions imposed by the Windows and MS-DOS applications used with SoftWindows.

Note: The SoftWindows application licensing system does not support the licensing of 32-bit Windows applications.

In particular, the licensing feature allows you to:

- Limit the number of users who can run a particular application.
- Prevent applications from being run beyond a specified expiry date. This can be used to ensure that users stop using an old version of an application.
- Provide a record of the applications being used, the users using them, and the hosts on which they are run.

To license applications you need to:

- Enable Windows and/or MS-DOS licensing for each SoftWindows user.
- Generate an application license for each Windows or MS-DOS application you want to license.

These procedures are described in the following sections:

- “Setting up application licensing”
- “Generating application licenses”

Setting up application licensing

The SoftWindows application licensing uses a small Windows and/or MS-DOS program to monitor each session being run. It then uses the standard FLEXlm system to administrate the licenses.

Although the system is effective, it is not guaranteed to be completely secure. Malicious users may be able to disable the licensing system, which will prevent any checking against licenses when applications are started.

The licenses themselves are set up using a GENLIC utility, provided with SoftWindows.

For security reasons, the program is not installed on the default SoftWindows hard disk file, but in the UNIX directory:

```
$SWINHOME/dos/insignia
```

Once an application is licensed, a user will be prevented from running an unauthorized copy and receive an error message.

To enable Windows application licensing

Add the following line to the [windows] section of each user's *WIN.INI* file:

```
LOAD=C:\INSIGNIA\WINLIC.EXE
```

Note: Windows and MS-DOS applications are licensed independently. For example, if you only want to license Windows applications, you only need *WINLIC.EXE*; there is no need to run *DOSLIC.EXE*.

To enable MS-DOS application licensing

Add the following line to each user's *AUTOEXEC.BAT* file:

```
C:\INSIGNIA\DOSLIC.EXE
```

To set up access to the license generator in Windows 95

Configure a VFSA drive to point to the *\$SWINHOME/dos/insignia* directory.

To set up access to the license generator in MS-DOS

1. Startup SoftWindows in MS-DOS mode.
2. Configure a suitable VFSA drive by typing the following command at the MS-DOS C:\> prompt:

```
NET USE F: $SWINHOME/dos/insignia
```

You can now run GENLIC from the VFSA drive or copy it to a suitable directory.

Generating application licenses

To generate a license

Type the following command at the MS-DOS C:\> prompt.

```
GENLIC application
```

where *application* is the full drive, path, and name of the application to be licensed. For example, to license Microsoft Word for Windows you would type:

```
GENLIC C:\WORD\WINWORD.EXE
```

This prompts you for the following information:

Table 11-1 License Prompt Descriptions

Prompt	Description
Start date	The date from which the license is active.
Expiry date	The date the license expires.
Number of	The number of simultaneous users copies of the application that may be run.
User string	A string of up to 64 characters describing the application, to help identify the appropriate line in the license file. This defaults to the application filename.
Server name	The host name of the license server workstation.
Server ID	The host ID of the license server workstation.

To obtain the server ID, login to the license server and type the following command at a shell prompt:

```
$SWINHOME/FLEXlm/lmhostid
```

Alternatively, see the `SERVER` line in the existing `license.dat` file.

The `GENLIC` utility will then display the correct license line on the screen, as shown below, and you should write this down before exiting or entering information for another application.

A sample license line is as follows:

```
FEATURE VaTG62Ua insignia 4.000 1-jan-04 4 5DC04041C6EE3F7CCC43  
"EDIT.COM"
```

The fields in this line are described in the following table:

Table 11-2 License Field Descriptions

Field	Description
FEATURE	Identifies the type of line to the license server.
VaTG2Ua	An encrypted feature name, generated from the Windows or MS-DOS program being licensed.
insignia	Specifies that the Insignia daemon controls the license.
4.000	The version number of the feature. This will always be 1.000 for Windows and MS-DOS application licenses.
1-jan-0	The expiry date, if specified.
4	The number of users.
5DC0...	The FLEXlm encryption code.
EDIT.COM	The user string. Can be set to any string value when the license is created, but cannot subsequently be changed.

To define a license for unlimited users

Specify the number of users as 0, and include a further field, DEMO, following the number of users.

The encrypted feature name depends on the application program file, and is independent of the program name or path name. However, different versions of the same program will generate unique feature names and must be licensed independently. Therefore, for each program license either ensure that all users are using the same version or make separate licenses for each version in use.

To install the application licenses

The Windows and MS-DOS application licenses must be added to the license file used by the Insignia licensing daemon unless it is combined with licenses for other products. The default location is:

```
$SWINHOME/FLEXlm/license.dat
```

where *\$SWINHOME* is the SoftWindows installation directory.

1. Add the feature line displayed by GENLIC for each Windows or MS-DOS application to the end of the license file using a suitable text editor, such as vi.

Be careful to enter the feature line exactly as displayed by GENLIC, and on a single line.

There must only be one feature line for each unique feature name, that is, for each unique Windows or MS-DOS application.

2. After making changes to the license file, type the following command at the UNIX prompt:

```
$SWINHOME/FLEXlm/lmreread -c $SWINHOME/FLEXlm/license.dat
```

where *\$SWINHOME* is the SoftWindows installation directory.

This ensures that the licensing daemon takes account of the changes. Changes to the license file will normally only take effect on copies of SoftWindows which are started after *lmreread* has been executed.

To change the license for an application

To change the license for an application proceed as follows:

1. Generate a new feature line using GENLIC.
2. Replace the existing line in the license file.

For example, you can do this to increase the number of licenses available.

If the license file includes two lines with identical feature names, the second one will be ignored, and an error will be reported in the FLEXlm daemon log file.

Sample license file

The listing below shows a sample license file containing a SoftWindows FEATURE line, and FEATURE lines for a Windows and an MS-DOS application.

```
SERVER ivy 4606bc4e 744
DAEMON insignia /usr/SoftWindows/FLEXlm
FEATURE SoftWin95 insignia 4.000 01-jan-00 20 145BF061754DC412304A
"5003 6583 7650 0020"
FEATURE VaTG62Ua insignia 4.000 1-jan-0 4 5DC04041C6EE3F7CCC43
"EXCEL.EXE"
FEATURE 9VHNPQ83 insignia 4.000 30-jun-1996 0 D9E6A0F149743A74F357
"WP.EXE"
```

Reference

This chapter gives reference information about the SoftWindows environment variables and command-line options, and the Windows, MS-DOS, and UNIX utilities supplied with SoftWindows .

Environment variables

This section provides information about the environment variables used by SoftWindows:

DISPLAY

Specifies the name of the host and display number to use. It is usually set up by the X11 initialization process.

LM_LICENSE_FILE

The pathname of the SoftWindows license file or the host name and TCP/IP port number of a valid license server.

Default

\$SWINHOME/FLEXlm/license.dat

If *LM_LICENSE_FILE* is set in the environment, the default value is appended to it to form a path before it is used. To use a license server using the default TCP Port Number (744), type the following command at the UNIX prompt:

```
setenv LM_LICENSE_FILE 744@servername
```

NLSPATH

The pathname of the SoftWindows Native Language Support catalog.

Default

\$SWINHOME/nls/%L/%N.cat is prefixed to any existing value. Only applicable to platforms with NLS support.

SNERROR

Enables SoftNode error reporting.

Default

Not set.

It can be set to one of the following values:

Table 12-1 SNERROR

SNERROR	Effect
X	SoftNode errors are displayed in an error dialog box.
console	SoftNode errors are output to the system console.

This environment variable should only be used if network problems are being encountered.

See also “-snerror.”

SW_MICROPHONE

Set to TRUE to use the microphone port for audio input. By default SoftWindows uses the port specified in the Audio Control Panel on the host workstation.

SW_JACK

Set to TRUE to use the jack port for audio input. By default SoftWindows uses the port specified in the Audio Control Panel on the host workstation.

SW_LINE_IN

Set to TRUE to use the line in port for audio input. By default SoftWindows uses the port specified in the Audio Control Panel on the host workstation.

SW_CD_IN

Set to TRUE to use the CD in port for audio output. By default SoftWindows uses the port specified in the Audio Control Panel on the host workstation.

SW_INTERNAL_SPEAKER

Set to TRUE to use the internal speaker port for audio output. By default SoftWindows uses the port specified in the Audio Control Panel on the host workstation.

SW_HEADPHONE

Set to TRUE to use the headphone port for audio output. By default SoftWindows uses the port specified in the Audio Control Panel on the host workstation.

SW_LINE_OUT

Set to TRUE to use the line out port for audio output. By default SoftWindows uses the port specified in the Audio Control Panel on the host workstation.

SWINHOME

The directory containing the SoftWindows package.

Default

/usr/SoftWindows

SWIN_WORKAROUND_CDE_MOTIF_BUG

Set to TRUE to overcome the following problem:

On some 24 bit True Color display adaptors, SoftWindows may fail to start, reporting an error similar to:

```
X Error of failed request: BadValue (integer parameter out of range
for operation)
Major opcode of failed request: 91 (X_QueryColors)
```

Default

Not set.

WINDOWS_DPI

Specifies the DPI (Dots Per Inch) value for the SoftWindows Windows Driver when running Windows 3.11. The default value is 96. Used to change the sizes of characters within applications such as Microsoft Word and Excel. Setting to a number larger than 96 increases character size.

To change the font size in Windows 95 use the Font Size settings in the Display control panel.

XUSERFILESEARCHPATH

The search path used by SoftWindows to find the X resource file.

Default

SoftWindows adds the directories `$SWINHOME/%L/%N` and `$SWINHOME/%N` to the end of the existing path.

Command line options

This section gives details of the SoftWindows command line options which can be used to gain extra functionality from SoftWindows.

-backing_store

Allows the SoftWindows Microsoft Windows driver to make use of the backing store facility within the X server.

If this facility does not exist, SoftWindows will not display correctly when the *-backing_store* option is used.

-bs

On SGI systems, use *-bs* instead of *-backing_store*.

-batch

Instructs SoftWindows to select the default option whenever an error or dialog panel appears.

This allows the user to run batch jobs in SoftWindows without intervention. Note that even with this option selected, setup errors, such as the hard disk file specified in the SoftWindows configuration file not being present, will still wait for user input. It is therefore important to ensure that the SoftWindows configuration is correct before using this option.

-c (lower case)

For Windows 3.11 and MS-DOS disks only. Executes an MS-DOS command or a series of MS-DOS commands. When SoftWindows boots to MS-DOS, it will execute the commands specified.

Example

```
SoftWindows95 -c win
```

SoftWindows will boot into MS-DOS, and then start Microsoft Windows. Alternatively, if you type the command:

```
SoftWindows95 -c "cd workdir;testprog.exe"
```

SoftWindows, once booted to MS-DOS, will change to the directory `workdir`, and execute the program `testprog.exe`. Please note that the symbol ";" above gets translated into an <Enter> keystroke before the commands are executed in MS-DOS.

-C (upper case)

For Windows 3.11 and MS-DOS disks only. Executes a specific -DOS commands, executing MS-DOS command which currently resides on the UNIX system. The user passes the full UNIX pathname including the filename to SoftWindows, which then sets up the K: drive as a VFSA drive and executes the DOS command from that drive.

Example

```
SoftWindows95 -C /usr/users/john/testprog.exe
```

SoftWindows will set up the K: drive to be `/usr/users/john`, and will execute `testprog` from K:. The filename specified must be a valid MS-DOS executable, with a `.BAT`, `.COM`, or `.EXE` extension. If the user has a K: drive already set up in the user's SoftWindows configuration file, this option will first detach the drive before reassigning it to the user-specified pathname. It will then leave the K: drive set up to point to the new drive path.

-config

Specifies an alternative SoftWindows configuration file.

Example

```
swin -config /tmp/swinconfig
```

This will read the SoftWindows configuration from `swinconfig` in `/tmp`, and will save the new configuration to the same file. However, if the specified configuration file is not present, SoftWindows will prompt for one to be created using the system defaults.

-snerror

Enables SoftNode error reporting.

Example

```
swin -snerror
```

This command line option should only be used if network problems are being encountered.

See also "SNERROR."

-std_windows

The version of Microsoft Windows shipped as part of the SoftWindows product has been optimized for use with SoftWindows. If you want to use a different version of Microsoft Windows, specify this option when starting SoftWindows.

-visual

Specifies which visual display SoftWindows will run on. This option should be followed by the number of the visual display as a hexadecimal number.

Example

```
swin -visual 0x2a
```

In order to get the actual visual display number use *xdpinfo*, or a similar utility.

-w (lower case)

Executes a specific Windows command which currently resides on the UNIX system. The user passes the full UNIX pathname including the filename to SoftWindows, which then sets up the K: drive as a VFSA drive and executes the Windows command from that drive.

Example

```
swin -w /usr/users/john/testprog.exe
```

SoftWindows will set up the *K:* drive to be */usr/users/john*, and will execute *testprog* from *K:*. The filename specified must be a valid Windows executable, with a *.BAT*, *.COM*, or *.EXE* extension. If the user has a *K:* drive already set up in the user's SoftWindows configuration file, this option will first detach the drive before reassigning it to the user-specified pathname. It will then leave the *K:* drive set up to point to the new drive path.

PC utilities and device drivers

CDROM.SYS

The device driver which interfaces an MS-DOS CD-ROM program such as Microsoft MSCDEX to a CD-ROM device connected to your UNIX workstation. *CDROM.SYS* must be loaded before running MSCDEX. The UNIX device name is configured in the SoftWindows Open Disk Drives dialog box.

Example

In *C:\CONFIG.SYS* include the line:

```
DEVICE=C:\INSIGNIA\CDROM.SYS
```

See also "USECD.BAT," "MSCDEX options" (standard MS-DOS command), and the sections *Using CD-ROMs* in the *SoftWindows User's Guide*, and "Setting up the CD-ROM."

DDMINI32.DLL

Direct draw support.

DEVLOD.COM

Allows users to load MS-DOS device drivers which are normally loaded in from the *CONFIG.SYS* file, after MS-DOS has fully booted. It is supplied courtesy of Jim Kyle and the authors of *Undocumented DOS*.

One of the uses of this utility is to allow Microsoft LAN Manager and SoftWindow's VFSA to coexist. If you want to use both of these at the same time, load LAN Manager first, and, when you have logged into the LAN Manager server, load *HOST.SYS* to enable SoftWindow's VFSA system with the following command:

```
C:\INSIGNIA\DEVLOD C:\INSIGNIA\HOST.SYS
```

To automatically enable SoftWindow's VFSA system, add the command to the *AUTOEXEC.BAT* file after the commands which load Microsoft LAN Manager. You must also move the line:

```
C:\INSIGNIA\FSADRIVE
```

to be after this command.

DOSLIC.EXE

An application licensing interface, to check licenses for MS-DOS applications. This is normally included in the *AUTOEXEC.BAT* file.

Example

In *AUTOEXEC.BAT*, include the line:

```
C:\INSIGNIA\DOSLIC.EXE
```

Note: *DOSLIC.EXE* does not need to be loaded if only Windows applications are to be licensed.

See also "WINLIC.EXE."

DOS2UNIX.EXE and UNIX2DOS.EXE

Converts text files between MS-DOS and UNIX formats.

UNIX and MS-DOS conventionally store text files in slightly different formats. MS-DOS files have two characters at the end of each line (Carriage Return followed by Line Feed), and have a `CTRL-Z` (Decimal 26, Hex 1A) character at the end of the file.

UNIX files have only a Line Feed character at the end of each line and have no special character at the end of the file.

DOS2UNIX.EXE converts the input file, which is assumed to be in MS-DOS format, to UNIX format.

UNIX2DOS.EXE converts the input file, which is assumed to be in UNIX format, to MS-DOS format.

In both cases, if only one filename is given it is used as both the input file and the output file. That is, the file is converted without changing its name. If two filenames are given, the first is used as the input file and the second as the output file.

Always be sure that the files you are converting are simple text files which can be edited using a simple MS-DOS editor like *EDIT.COM* or a UNIX editor such as *vi*. Converting other file types, such as files in the normal storage format of a word processor, may damage the files or lose data. If you are in doubt, always use the two filename format of the command, leaving the original file unchanged.

Example

To convert *NAMES.TXT* to UNIX format, replacing *NAMES.TXT* with the new file:

```
DOS2UNIX NAMES.TXT
```

To convert *ADDRESS.TXT* to MS-DOS format, writing the result to *DOSADDR.TXT*:

```
UNIX2DOS ADDRESS.TXT DOSADDR.TXT
```

ETHERSPC.COM

The SoftWindows Ethernet ODI driver. It allows PC-based protocol stacks to transmit and receive information via the host's own Ethernet connection.

Note: A SoftWindows network session uses the same physical address as the host on which it is running.

EXITSWIN.COM

Exits from SoftWindows. Include the /S switch to save any changes that have been made to the SoftWindows configuration. Otherwise, any unsaved changes to the configuration will be lost.

Example

```
EXITSWIN /S
```

FSADRIVE.COM

Provides access to the UNIX file system using the SoftWindows FSA drives. This utility is normally included in *AUTOEXEC.BAT*.

If the utility is entered on its own, all assigned VFSA drives are started. If *FSADRIVE.COM* is followed by one or more drive letters, the assigned VFSA drives will be started. Also the named drives will be reserved and can be assigned from within the SoftWindows user interface.

Note: *HOST.SYS* must be loaded before *FSADRIVE.COM* is executed.

Example

In *C:\AUTOEXEC.BAT*, include the line:

```
C:\INSIGNIA\FSADRIVE.COM
```

See also "HOST.SYS."

HOST.SYS

A redirector which provides access to the UNIX file system using the SoftWindows VFSA drives. It is normally loaded by *CONFIG.SYS*.

Example

In *C:\CONFIG.SYS*, include the line:

```
DEVICE=C:\INSIGNIA\HOST.SYS
```

See also "FSADRIVE.COM."

HPITF.SYS

See "SMRTCP32.EXE."

INS_ESDI.PDR

Windows 95 hard disk driver.

INSIGNIA.386

Windows 95 and Windows 3.11 driver.

INSMINI.VXD

Windows 95 32-bit mouse driver.

ISETH.SYS

The NDIS 3.1 miniport driver for Ethernet.

ISLCDROM.PDR

Windows 95 CD driver.

ISNP32.DLLVFS

VFSA Network Provider for Windows 95.

MOUSE.COM

The SoftWindows MS-DOS Mouse Driver.

This must be loaded to use the mouse in MS-DOS applications, and is normally loaded by *AUTOEXEC.BAT*. To use the mouse, run an application that can use a mouse (such as the MS-DOS EDIT program) and attach the UNIX mouse to MS-DOS by pressing the middle mouse button.

Note: It is not necessary to load *MOUSE.COM* to be able to use the mouse in Windows, since SoftWindows loads a separate mouse driver when Windows is started.

Example

In *AUTOEXEC.BAT*, include the line:

```
C:\INSIGNIA\MOUSE.COM
```

See also the section "Using the mouse in MS-DOS" in the *SoftWindows 95 for UNIX User's Guide*.

NET JOIN

Logically joins a disk drive to a subdirectory in another drive.

A typical *JOIN* command, such as

```
NET JOIN E: F:\MY_FILES
```

means that *MY_FILES*, which is the name of an existing directory, becomes a new subdirectory on drive *F*; so all the data on the disk in drive *E*: is now in the directory structure of drive *F*:

To delete a join, you use the */D* argument, as in:

```
NET JOIN E: /D
```

Note: SoftWindow's *NET* command is installed in *C:\INSIGNIA*.

NET SUBST

Substitutes a drive letter for a path.

The *SUBST* command:

```
NET SUBST E: F:\LEVEL1\LEVEL2
```

causes the subdirectory specified in the command line to be substituted for the root directory of drive *E*:. All references to drive *E*: now access this subdirectory.

To delete a substitution, use the */D* argument. For example:

```
NET SUBST E: /D
```

will delete any substitution applied to drive *E*:

Note: *NET JOIN* and *NET SUBST* only work with VFSA drives; they do not work with hard disk drives.

Note: SoftWindow's *NET* command is installed in *C:\INSIGNIA*.

NET USE

Assigns and removes FSA drives.

NET USE supports the following options:

Table 12-2 NET USE Options

Option	Description
<i>/D</i>	<p>This removes the assignment of a VFSA drive. For example, to remove the VFSA drive <i>H:</i> type the command:</p> <p>NET USE H: /D</p>
<i>/CS</i>	<p>This is for use when the VFSA file system uses 8.3 format names and the server responds to both upper case and lower case filename requests. This is required for file systems on some OS/2 servers. On such a server, without the <i>/CS</i>, each file name will be mapped. For example:</p> <p>NET USE J: /servers/os2_sys /CS</p> <p>New files are created with lower case names.</p> <p>The <i>/CS</i> option should not be used on file systems where case may be used to distinguish between two different files.</p>
<i>/UC</i>	<p>Lower case names are mapped provided they can fit into an 8.3 format, and upper case names are not mapped. This is the opposite of the default action where upper case names are mapped and lower case names are not mapped. For example:</p> <p>NET USE J: /users/MS-DOS-FILES /UC</p> <p>New files are created in upper case.</p> <p>This can be used for file systems on servers which use all upper case filenames. It can also be used if you have a directory structure on a UNIX file system which you want to use exclusively for MS-DOS files, and you want the names to be all upper case.</p>

Note: SoftWindow's *NET* command is installed in *C:\INSIGNIA*.

RUNIX.COM

Executes a UNIX command from MS-DOS.

To use *RUNIX.COM* the required UNIX command must be accessible on a VFSA drive. The argument to *RUNIX.COM* must be the full path to the UNIX command.

The standard output of the UNIX command is the same as that of SoftWindows. Therefore, if SoftWindows is started from a terminal window, the output of the UNIX command will print to that window. If SoftWindows is started by another method for example, from a display manager menu or a file manager, the output of the UNIX command may not be visible or it may be written to the system console.

Normal UNIX permission and ownership rules apply when accessing and executing a command. That is, the command must be readable, and the user must have execute permission.

The command may use forward or backward slashes as delimiters (/ or \), but should otherwise conform to UNIX rather than MS-DOS conventions (case sensitive, and not limited to the 8.3 format).

Use the /Q option to suppress printing to the MS-DOS display except where an error occurs in executing the command.

Example

With *E:* configured to access the UNIX directory *\$HOME*:

```
RUNIX E:\scripts\my_script
```

SECURITY.COM

Enables keys which are disabled during the boot phase when SoftWindows is configured to run in Secure Mode.

The keys enabled are 5, 8 and S. *SECURITY.COM* should be run from *AUTOEXEC.BAT* when SoftWindows is in Secure Mode.

SECURITY.COM has no effect when SoftWindows is not in Secure Mode.

Example

Include the following line in *AUTOEXEC.BAT*:

```
C:\INSIGNIA\SECURITY.COM
```

See also "Running SoftWindows in secure mode."

SMRTCPY.EXE

Program to cut and paste between Windows 3.11 and host.

SMRTCP32.EXE

32-bit program to cut and paste between Windows 95 and the host.

SPCMSWD.DRV

Display driver for Windows 3.11.

SPCMSWM.DRV

Mouse driver for Windows 3.11.

SW95MSWD.DRV

Windows 95 Display driver.

SWINSND.DRV

Windows 95 and Windows 3.11 sound driver.

SWINSND.VXD

PnP support for Windows 95 sound.

UNIX2DOS.EXE

See "DOS2UNIX.EXE and UNIX2DOS.EXE."

USECD.BAT

Loads the MS-DOS *MSCDEX.EXE* program, to enable a CD-ROM device to be configured as the *F:* drive under MS-DOS.

C:\INSIGNIA\CDROM.SYS, the SoftWindows CDROM interface driver, must already be loaded in *CONFIG.SYS* when *USECD.BAT* is run. The UNIX device name is configured in the SoftWindows Open Disk Drives dialog box.

Example

```
USECD
F:
DIR
```

See also “CDROM.SYS,” “MSCDEX options,” “Using CD-ROMs” in the *SoftWindows 95 for UNIX User’s Guide*, and “Setting up the CD-ROM.”.

VFSA.VXD

VFSA Host Filesystem access driver for Windows 95.

WINIDLE.EXE

Program to idle SoftWindows when Windows 3.11 is inactive.

WNIDLE32.EXE

32-bit program to idle SoftWindows when Windows 95 is inactive.

WINLIC.EXE

An application licensing utility that checks licenses for Windows applications. *WINLIC.EXE* must be loaded when Windows starts up by including a line in the [windows] section of the user’s *WIN.INI* file.

Note: *WINLIC.EXE* does not need to be loaded if only MS-DOS applications are to be licensed.

Example

In *C:\WINDOWS\WIN.INI*, include the following line in the [windows] section:

```
load=c:\insignia\winlic.exe
```

See also "DOSLIC.EXE."

WINSOCK.DLL

The 16-bit Winsock (1.1) networking library for Windows 3.11.

WSOCK32.DLL

The 32-bit Winsock (1.1) networking library for Windows 95.

UNIX utilities

dostounix and unixtodos

Converts files between MS-DOS text format and UNIX text format.

This allows you to share text files between MS-DOS and UNIX.

Example

To convert *AUTOEXEC.BAT* to *unixauto.bat* in UNIX format:

```
dostounix AUTOEXEC.BAT unixauto.bat
```

To convert the UNIX *.profile* file to *PROFILE.TXT* in MS-DOS format:

```
unixtodos .profile PROFILE.TXT
```

PS and PSfilter

Overcome a problem that can occur when printing PostScript.

When printing PostScript some MS-DOS or Windows applications include the *Ctrl-D* character which signifies the end of file to UNIX, and this may result in incomplete print jobs.

PS uses *PSfilter* to extract the Ctrl-D character, avoiding the problem. When setting up your LPT/COM port, you simply need to pass your remote printer name to *PS*. For example, if you have a remote printer called *lp-1*, you would use the following:

```
PS -dlp-1
```

When printing to a remote printer note that, once the MS-DOS/Windows print job has finished, you should flush the LPT/COM port to indicate to SoftWindows that the job is complete. SoftWindows will then send the whole print job to the remote printer. Alternatively, you can use the Auto Flush feature to configure SoftWindows to automatically send print jobs to the remote printer after a preset time period.

See also, "To flush output automatically" in the "Printing, input, and output" section of *SoftWindows 95 for UNIX User's Guide*.

unixtodos

See "dostounix and unixtodos."

Error messages

Additional information may be appended to the end of an error if appropriate.

Table 13-1 Error Messages

Number: Error	Cause and recommended action
0: The SoftWindows CPU has encountered an illegal instruction.	<p>The PC application you are using has tried to execute an instruction that is not valid on the SoftWindows 486 CPU. This normally indicates a fault in the PC program, possibly due to a faulty installation.</p> <p>Reinstall your PC application and/or try running it on a 486 PC.</p>
4: The hard disk file cannot be found.	<p>Verify the name of the hard disk file you have specified.</p>
5: Floppy drive problem. The drive is already in use, so it cannot be used by SoftWindows.	<p>The floppy drive which SoftWindows is attempting to access is being used by another UNIX process.</p> <p>Shut down the other program which is using the floppy drive and activate the drive by choosing Actions from the Activate menu.</p>
6: The hard disk path name is invalid.	<p>SoftWindows cannot find the directory you have specified for the hard disk file.</p> <p>Verify and correct the directory name. If the path to the hard disk file contains an environment variable (such as <i>\$HOME</i>), verify that it is set correctly in the environment when SoftWindows is started. If a change to the SoftWindows environment is required, SoftWindows must be restarted before the change will take effect.</p>

Table 13-1 (continued) Error Messages

7: The hard disk is not accessible – please check file name and permissions.	<p>You do not have the correct permissions to access the hard disk file.</p> <p>Verify that you have read and/or write permission for the hard disk file.</p> <p>If necessary use the UNIX <i>chmod</i> command to modify the permissions to ensure that the user has proper access to the file.</p>
8: The hard disk file is not a valid hard disk (disk geometry incorrect).	<p>SoftWindows does not recognize the specified file as a valid hard disk file.</p> <p>Verify that the correct path and filename have been specified for the hard disk file. If these are correct, the hard disk file may have been damaged. You should restore your hard disk file from backups if possible or create a new hard disk file.</p>
10: The new hard disk file could not be created.	<p>SoftWindows could not create the specified hard disk file.</p> <p>Verify that you have write permission for the directory in which the hard disk file is to be created and that the file system has sufficient free space. If necessary, change permissions on the directory or specify a different location for the hard disk file.</p>
11: The hard disk has been mounted read only because you do not have write permission for the file. Check the file permissions if you need to write to the disk	<p>You do not have write permission for the hard disk file. If you need to write to the disk, modify the hard disk file permissions. If you do not need to write to the disk, consider using the optional configuration parameter <i>RO_DISK_PANEL_DISABLE</i> in your SoftWindows configuration file.</p>
12: Internal error in SoftWindows procedure.	<p>Contact Technical Support.</p>
13: The host filesystem directory cannot be found.	<p>SoftWindows cannot access the directory specified for an FSA drive.</p>

Table 13-1 (continued) Error Messages

	Verify that the specified directory exists and that you have appropriate permissions on it. If the path contains an environment variable (such as <i>\$HOME</i>), verify that it is set correctly in the environment when SoftWindows is started. If a change to the SoftWindows environment is required, SoftWindows must be restarted before the change will take effect.
14: The host filesystem name must be a directory.	The path specified for an FSA drive does not specify a directory. Verify and correct the path. It must specify a directory or a symbolic link to a directory, not a regular file or a special file.
15: The host filesystem must have read access.	You do not have read access for the directory specified for an FSA drive. Verify that you have appropriate permissions for the directory.
16: Floppy drive problem. SoftWindows cannot access the floppy device.	Verify the device name specified for the floppy drive and that the floppy drive is not mounted under UNIX.
17: SoftWindows does not support a ROM BASIC.	A PC program has tried to use the ROM BASIC interpreter which was available on some early PCs. Use another BASIC interpreter.
20: Drive C: & Drive D: cannot be the same file:	You have specified the same hard disk file for both the C: and D: drives. Select a different hard disk file for one of the drives or select no D: drive by deleting the hard disk file name from the configuration.
21: The file named below is not a valid keyboard file.	SoftWindows does not recognize the file as containing valid keyboard mapping information.

Table 13-1 (continued) Error Messages

	<p>Verify the path and filename for the mapping file. Normally these should refer to a file in <i>\$SWINHOMe/keyboard</i>, and the filename should end in <i>.kbd</i>.</p> <p>If these are correct, the mapping file may be corrupted and should be reinstalled.</p>
<p>23: The file named below is not accessible to SoftWindows.</p>	<p>Verify the path and filename and the permissions on both the directory and the file. If the path contains an environment variable (such as <i>\$HOME</i>), verify that it is set correctly in the environment when SoftWindows is started. If a change to the SoftWindows environment is required, SoftWindows must be restarted before the change will take effect.</p>
<p>24: A continuous RESET state has been entered.</p>	<p>A PC program has caused the PC to continually reset. This may indicate a fault in the PC program, possibly due to a faulty installation.</p> <p>Reinstall your PC application and/or try running it on a Pentium PC.</p>
<p>25: Invalid Extended Memory size.</p>	<p>The configured Extended Memory size is greater than the maximum value permitted by the <i>MEMORY_EXTENDED_MAX_SIZE</i> entry in the system configuration file (<i>sys.swinconfig</i>).</p> <p>Reduce the configured Extended Memory size or increase the value of <i>MEMORY_EXTENDED_MAX_SIZE</i> in the system configuration file.</p>
<p>27: Invalid Autoflush Delay.</p>	<p>The configured Autoflush Delay is greater than the maximum value permitted.</p> <p>Change the Autoflush Delay to a value in the range 1 to 300.</p>
<p>28: The window manager is not configured to display the requested video mode.</p>	<p>SoftWindows has been asked to display in a mode that is too large for the screen configuration.</p>

Table 13-1 (continued) Error Messages

	If you are using a PC application that requests a high resolution video mode, configure it to use a lower resolution mode.
30: The SoftWindows resource file could not be created. (It will not be updated)	SoftWindows could not create the indicated file. Verify that the directory is not write-protected. If necessary, change the permissions.
31: The SoftWindows resource file could not be updated. (Continuing will attempt to create the file in \$HOME).	SoftWindows could not write to the indicated file. Verify that the directory and file are not write-protected. If necessary, change the permissions.
32: The <i>drive</i> drive is not being used.	The <i>NET USE X: /D</i> command has been used on a drive which is not currently configured as an FSA drive. Verify that you have specified the intended drive in the <i>NET USE</i> command.
33: The <i>drive</i> drive is not a network drive.	The <i>NET USE X: /D</i> command has been used on a drive that is not an FSA drive. Verify that you have specified the intended drive in the <i>NET USE</i> command.
34: The <i>drive</i> drive is already in use.	You have tried to set up an FSA drive which is already in use. Verify that the intended drive is specified in the <i>NET USE</i> command. Use the <i>NET USE X: /D</i> command to disconnect the drive before setting it up. Alternatively, use the Open Disk Drives dialog box to configure the FSA drive as required.
35: The host filesystem directory cannot be found.	SoftWindows cannot access the directory specified for an FSA drive.

Table 13-1 (continued) Error Messages

	<p>Verify that the specified directory exists and that you have permission to access it. If the path contains an environment variable (such as <i>\$HOME</i>), verify that it is set correctly in the environment when SoftWindows is started. If a change to the SoftWindows environment is required, SoftWindows must be restarted before the change will take effect.</p>
<p>36: The host filesystem directory must be a directory.</p>	<p>The path specified for an FSA drive does not specify a directory.</p> <p>Verify the pathname and correct it if necessary. It must specify a directory, or a symbolic link to a directory, not a regular file or a special file.</p>
<p>37: The host filesystem directory must have read access.</p>	<p>You do not have read access for the directory specified.</p> <p>Verify that you have appropriate permissions on the directory.</p>
<p>39: Illegal drive specification.</p>	<p>You have tried to set up an FSA drive beyond the value of <i>LASTDRIVE</i> set in <i>CONFIG.SYS</i>.</p> <p>Change <i>LASTDRIVE</i> in <i>CONFIG.SYS</i> to a higher letter, or use a drive which is not greater than the value of <i>LASTDRIVE</i>.</p>
<p>40: The font files could not be opened by SoftWindows.</p>	<p>The X server cannot load fonts required by SoftWindows.</p> <p>Make sure that the appropriate SoftWindows font directory can be read by the X server. To do this, execute the following commands before SoftWindows is started:</p> <pre>xset +fp install/fonts/dir</pre> <pre>xset fp rehash</pre> <p>Where <i>install</i> is the full network path of the SoftWindows installation directory, and <i>dir</i> is a directory which depends on the type of platform being used to display SoftWindows.</p>

Table 13-1 (continued) Error Messages

	<p>If you are displaying to a remote display or an X terminal, ensure that the appropriate font directory is mounted and can be read by the X server.</p>
<p>41: X Windows System compatibility problem. The visual class is other than StaticGray, GrayScale or Pseudocolor.</p>	<p>The X display does not support a visual class which SoftWindows requires for color or grayscale display.</p> <p>Windows will operate in a monochrome mode only. This may be acceptable, depending on the application. For MS-DOS applications, you may be able to configure the application to operate in a mode that does not require color display. Otherwise, use an X display that provides an appropriate visual class.</p>
<p>42: The sound hardware cannot be accessed. SoftWindows will continue with sound turned off.</p>	<p>Check that audio support is correctly configured on the host workstation. See your workstation documentation.</p>
<p>43: Output error - SoftWindows was unable to write to the specified pipe. This was probably due to invalid parameters in the setup of a COM or LPT port. Selecting continue will disable this port to allow the problem to be corrected :</p>	<p>SoftWindows failed to open a pipe and execute the command specified for the port.</p> <p>Verify that the command is available to SoftWindows (via <i>PATH</i> or a fully specified directory), has appropriate permissions, and operates correctly when data is piped into its standard input.</p> <p>One common reason for this error is if you are attempting to print without a default printer setup under UNIX. If the <i>lp</i> command issued at the UNIX prompt in a UNIX shell returns an error message, then SoftWindows will be unable to print through the <i>lp</i> command. You will need to activate the port again using the Actions > Activate menu to re-enable printing to this port. See the help menu entry on Printing or the help button in the Options > COM/LPT Ports dialog panels for more information.</p>

Table 13-1 (continued) Error Messages

<p>44: The memory resources needed by SoftWindows could not be allocated. Select Continue to retry.</p>	<p>This is probably due to lack of available swap space. Shutting down other UNIX programs may make more swap space available. If this message is often seen, consider increasing the swap space, or reducing the number of applications being run on the workstation.</p>
<p>45: The host computer has no floppy drive that SoftWindows can access.</p>	<p>The specified floppy device is not valid for the host machine. See "Setting up floppy disk drives."</p>
<p>46: SoftWindows cannot continue because the environment variable SWINHOM is not set.</p>	<p>Ensure that <i>SWINHOM</i> is set in the environment before SoftWindows is started. <i>SWINHOM</i> should be set to the full path of the directory in which SoftWindows is installed (such as <i>usr/SoftWindows</i>).</p>
<p>47: An installation file required by SoftWindows is missing. Execution must terminate.</p>	<p>Verify that the <i>SWINHOM</i> is set in the environment, and indicates the correct directory for the SoftWindows installation. Also verify that <i>\$HOME</i> is set to indicate the user's home directory. If these are both correct, the SoftWindows installation may be damaged. The indicated file may have to be restored from backups or SoftWindows may have to be reinstalled.</p>
<p>48: A configuration file entry is duplicated or there is an unrecognized entry. You may select Default to ignore this entry, or type a correct entry name and value, then select Continue.</p>	<p>There is an invalid entry in <i>\$\$SWINHOM/sys.swinconfig</i> or <i>\$HOME/.swinconfig</i>.</p> <p>Enter the correct value in the dialog or exit SoftWindows and correct the file using a text editor. If the error is in <i>\$HOME/.swinconfig</i>, the new value entered will take effect the next time the SoftWindows configuration is saved.</p>

Table 13-1 (continued) Error Messages

	<p>If the error is in <code>\$SWINHOME/sys.swinconfig</code>, this message will be displayed each time SoftWindows is started. In this case <code>\$SWINHOME/sys.swinconfig</code> should be edited using a text editor to correct the entry.</p> <p>Whenever <code>\$SWINHOME/sys.swinconfig</code> is edited verify that it is owned by root and has the SUID bit set.</p>
<p>50: The configuration file is missing from your home directory. Select Default and a copy will be made from the system defaults.</p>	<p>The file <code>\$HOME/.swinconfig</code> does not exist. This is normal the first time SoftWindows 95 is launched by each user, even if a previous version of SoftWindows has been used. No action is required. The file will be created the first time the SoftWindows configuration is saved using the Actions menu, or when SoftWindows is exited.</p> <p>The new file will use default values from the system configuration file (<code>\$SWINHOME/sys.swinconfig</code>). If you have used a previous version of SoftPC or SoftWindows, you may want to copy some entries from your previous configuration file.</p> <p>If you have used SoftWindows 95 before, and believe you have saved a configuration, verify that the value of <code>\$HOME</code> is set correctly when SoftWindows is started.</p>
<p>51: The configuration file in your home directory cannot be written to by SoftWindows.</p>	<p>You cannot write the file because of a permissions problem or lack of available disk space.</p> <p>Verify that the value of <code>\$HOME</code> is set correctly and that you have permission to write to the directory. If the indicated file already exists, verify that you have write permission for that file. Verify that the filesystem containing your home directory is mounted with write permission and has sufficient free space on it.</p>

Table 13-1 (continued) Error Messages

55: The communications name is invalid.	The given device cannot be opened or is incompatible with SoftWindows.
	Verify that the correct special device name has been given and that it has appropriate permissions. Normally the user must have read-write permission on the device. Verify that the Device Type is set correctly on the SoftWindows Comms Ports or Printer Ports dialog.
56: The configuration file in your home directory has an option with a bad value.	Edit the configuration file in your home directory (<i>.swinconfig</i>) to correct the value.
57: The system default configuration file has an invalid value.	Edit the system default configuration file (<i>(\$SWINHOME/sys.swinconfig)</i> to correct the value. After editing the file, verify that the file is owned by root and has the SUID bit set.
58: The system default configuration file has a duplicate or unrecognized entry.	Edit the system default configuration file (<i>(\$SWINHOME/sys.swinconfig)</i> to correct the value. After editing the file, verify that the file is owned by root and has the SUID bit set.
59: The system default configuration file has a missing entry.	Edit the system default configuration file (<i>(\$SWINHOME/sys.swinconfig)</i> to add the required entry. After editing the file, verify that the file is owned by root and has the SUID bit set.
60: The configuration file entry shown below has an invalid value. You may select Default to replace it with the system default value, or type a correct value and select Continue.	A value in your configuration file (<i>(\$HOME/.swinconfig)</i> is invalid. If the error is continually given, there are two possible causes:

Table 13-1 (continued) Error Messages

	<p>If the configuration entry refers to a floppy drive, CD-ROM drive, or communications port, another process or another copy of SoftWindows may already have that device open. In that case, you should delete the device name, or type in an alternative device name (if available), and select Continue, or disable the use of that device in the other process.</p> <p>Alternatively, the system default configuration file</p> <p><i>(\$SWINHOMESYS.swinconfig)</i> may have an invalid value in it. If this is the case, edit the file to correct the value. After editing the file, verify that the file is owned by root and has the SUID bit set.</p>
<p>61: The configuration file entry shown below is empty. You may select Default to use the system default value, or type a correct value and select Continue.</p>	<p>A required value is missing from your configuration file (<i>\$HOME/.swinconfig</i>).</p> <p>If you enter a valid value and select Continue, or you select Default, the required entry will be automatically added to your configuration file the next time you save the SoftWindows configuration. If you select Exit, you should edit your configuration file (<i>\$HOME/.swinconfig</i>) to avoid the error recurring the next time SoftWindows is started.</p>
<p>62: SoftWindows cannot continue due to insufficient resources from the Native Language Support message catalogue.</p>	<p>SoftWindows cannot find the required text in its message catalogue.</p> <p>The message catalog may be corrupted. The file should be restored from backups or SoftWindows should be reinstalled. The message catalog file is <i>\$SWINHOMENLS/C/swin.cat</i>. If the message catalog file is removed, SoftWindows will use English text by default.</p>

Table 13-1 (continued) Error Messages

<p>65: SoftWindows could not find a lock daemon to protect the indicated file. We advise you to exit, and start the lock daemon. Continue only if you are sure that no other process will write to the file, and AT YOUR OWN RISK.</p>	<p>SoftWindows communicates with a lock daemon to ensure that files which it modifies are not being modified by another process, that is, another invocation of SoftWindows. This message indicates that SoftWindows failed to communicate with the daemon process.</p> <p>Verify that the lock daemon, normally called <i>lockd</i> or <i>rpc.lockd</i>, is running on the workstation on which SoftWindows is running and on the workstation on which the indicated file is located.</p> <p>If the indicated file is a hard disk file which SoftWindows must write to continually during normal operation, you should only continue if you are sure that it will not be modified by another process.</p> <p>If a hard disk file is modified by two processes at the same time, it could be seriously damaged and you could lose the data on it. If the file is your configuration file (<i>\$HOME/.swinconfig</i>), which SoftWindows opens and writes to very quickly, then continuing is unlikely to damage the file, but it is still a possibility.</p> <p>66: The date has been set forward, or the system frozen for a period. The PC date may be incorrect.</p> <p>SoftWindows has detected that the time and date on the UNIX system is significantly ahead of the time on the emulated PC. This may occur if the date on the UNIX system has been changed, or if SoftWindows has been frozen by the Auto Freeze option for several hours.</p> <p>If you are using an MS-DOS or Windows application that makes some use of the PC's time facilities, it may not operate as expected. This is not often a serious problem. If it causes difficulties with your application, avoid using the Auto Freeze option.</p>
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Table 13-1 (continued) Error Messages

67: The date has been set backward. The PC date may be incorrect.	<p>SoftWindows has detected that the time and date on the UNIX system is behind the date on the emulated PC. This is usually due to the date having been changed backwards on the UNIX system.</p> <p>If you are using an MS-DOS or Windows application that makes some use of the PC's time facilities, it may not operate as expected. This is not often a serious problem. Restarting SoftWindows will synchronize the time again.</p>
68: The file you have chosen for SoftWindows's floppy device is not a Character Special Device. All floppy device drivers must be Character Specials to work.	<p>You have selected an invalid device name for the floppy drive.</p> <p>Verify that the device name selected is correct. In particular, ensure that you have not selected a block special device name rather than a character special device name.</p>
69: Could not allocate 256 colors for Windows.	<p>You can try stopping other applications to free color resources, then press Continue or try to allocate 16 colors by pressing Default.</p>
70: Could not allocate 16 colors for Windows.	<p>You can try stopping other applications to free color resources, then press Continue or use another colormap by pressing Default.</p>
71: The hard disk is being mounted read-only because it is being accessed by another user:	<p>While a SoftWindows hard disk file is being used by a SoftWindows session, and can be written to, a lock is maintained on it. Only one SoftWindows process can hold the lock at any one time, thus preventing the hard disk file being corrupted.</p> <p>If you must write to the hard disk, you must ask the other user to release the lock on it by exiting the SoftWindows session or by deactivating the drive by selecting Activate from the Options menu. Deactivating a SoftWindows hard disk causes it to release the lock and become read-only.</p>

Table 13-1 (continued) Error Messages

	<p>Now Activate the disk or restart SoftWindows on the session which must write to the disk.</p>
<p>72: The hard disk is being mounted read-only. Either it is being accessed by an unknown user or there is no lock daemon running on your machine.</p>	<p>SoftWindows could not identify the user who is using a hard disk file or cannot communicate with the lock daemon.</p>
	<p>There may be a problem with the lock daemon. It may need to be restarted.</p>
<p>78: SoftWindows requires 256 modifiable colormap entries for full emulation of PC graphics adaptors. On this display, SoftWindows can provide only a black and white approximation, which may make some graphics programs hard to use.</p>	<p>Your display does not have sufficient colors available for SoftWindows to correctly emulate PC graphics adaptors.</p>
	<p>If you are using a color display and have other UNIX applications running which use many colors, close down those applications before starting SoftWindows. This may allow sufficient colors to be made available to SoftWindows for normal color operation.</p> <p>If your PC application is difficult to use in SoftWindows' black and white mode, it may be possible to configure the PC application to use a monochrome display mode, making it easier to use. Alternatively, use a different X display workstation.</p>
<p>79. SoftWindows was unable to allocate the amount of PC or expanded memory requested. You can free up memory used by other processes and press Continue to retry. Alternatively exit and edit the SoftWindows configuration file prior to restarting SoftWindows.</p>	<p>This may be due to insufficient swap space. Try to make more swap space available by exiting from other UNIX programs. If this fails to resolve the problem either allocate more swap space to the host, or reduce the amount of PC memory requested.</p>
<p>80: An unexpected file system error occurred while reading from a container file. Pressing Continue will retry the operation that failed.</p>	<p>SoftWindows is unable to read the hard disk file used as the C or D: drive.</p>

Table 13-1 (continued) Error Messages

	<p>In a UNIX terminal window, verify that the file is still accessible. If the hard disk container file is on a file server, not the workstation, verify that the file server has not crashed and is operating correctly. Also verify that the network connection between the workstations is operating correctly.</p>
<p>81: An unexpected file system error occurred while writing to a container file. Pressing Continue will retry the operation that failed.</p>	<p>SoftWindows is unable to write to the hard disk file used as the C: or D: drive.</p>
	<p>In a UNIX terminal window, verify that the file is still accessible. If the hard disk container file is on a file server, not the workstation, verify that the file server has not crashed and is operating correctly. Also verify that the network connection between the workstations is operating correctly.</p>
<p>82: SoftWindows has encountered a problem with the licensing system.</p>	<p>SoftWindows cannot find a valid license.</p> <p>User: Verify that <i>LM_LICENSE_FILE</i> is set in your environment when SoftWindows is started. The value should normally be <i>install/FLEXlm/license.dat</i>, where <i>install</i> is the SoftWindows installation directory, although a different value may be required depending on how the licensing system is configured. Verify the correct value with your system administrator.</p>

Table 13-1 (continued) Error Messages

	<p>Administrator: Verify that you have a valid SoftWindows license and that it has not expired. Your FLEXlm license file should contain a <i>FEATURE</i> line for <i>Insignia_SoftWindows</i>, and a <i>DAEMON</i> line for the <i>insignia</i> daemon. If you are using local licensing, verify that both <i>lmgrd</i> and <i>insignia</i> daemons are running, and are using the correct license file. Verify that the value of <i>LM_LICENSE_FILE</i> indicates this same license file when SoftWindows is started.</p> <p>If you are using a remote license server, verify that both <i>lmgrd</i> and <i>insignia</i> daemons are running on it and are using the correct license file.</p> <p>Verify that when SoftWindows is started, the value of <i>LM_LICENSE_FILE</i> indicates the correct license server name and TCP port number in the form <i>port@host</i>, for example, <i>744@licserv</i>. Verify that the network connection is operating correctly between the license server and workstation.</p> <p>Verify that the date and time are set correctly on both the license server and the workstation on which SoftWindows is to be run.</p>
<p>83: Your current SoftWindows license has expired. Apply to your SoftWindows dealer for a full license.</p>	<p>A SoftWindows 95 license has been found, but it has expired.</p>
<p>84: This copy of SoftWindows has lost its license. It will run for a further 5 minutes to allow you to save your work, and will then exit.</p>	<p>Apply to your SoftWindows dealer for a full license.</p>
	<p>The connection to the license server daemon has been lost. This normally indicates that the license server has crashed or the network connection to it is not operating correctly.</p>

Table 13-1 (continued) Error Messages

	<p>Immediately save work and exit from your Window or MS-DOS applications. Quit the applications cleanly, and exit from Windows. This will minimize the possibility of data being lost.</p> <p>The system administrator should verify operation of the license server, the <i>lmgrd</i> and <i>insignia</i> daemons, and the network connection between the license server and the workstation on which SoftWindows is being run. It will not be possible to restart SoftWindows until the licensing server can be accessed correctly.</p>
85. This demonstration of SoftWindows will terminate in 3 minutes.	SoftWindows will continue for a further 3 minutes and will then terminate. Save all your work before exiting.
86. This demonstration of SoftWindows is now terminating.	Following a 3-minute warning, the SoftWindows session is about to terminate. All unsaved work will be lost.
87. The license for SoftWindows has not been installed. Please contact your Customer Service Representative.	See "Licensing SoftWindows" for instructions on installing licenses.
88: All licensed SoftWindows are already running. Please contact your Customer Service Representative.	<p>You are already running the full number of copies of SoftWindows for which you have licenses installed.</p> <p>Purchase and install additional SoftWindows licenses or close down an existing invocation of SoftWindows before starting the new one.</p>
89: A concurrent license must be installed on the server machine.	You are installing a concurrent license, but you are not running SoftWindows on the license server. Run SoftWindows on the license server in order to install the license or enter the license information by editing the license file directly.
90: Failed to start the licensing daemon.	<p>SoftWindows could not start up the specified license daemon.</p> <p>Verify that the license daemon executable in the directory</p>

Table 13-1 (continued) Error Messages

	<p><i>\$SWINHOME/FLEXlm</i> is installed and has read and execute permissions set correctly. The daemon may have failed to start due to some general resource problem on the workstation, such as the maximum number of processes being exceeded or the workstation memory or swap space being full. If you suspect that may be the case, try shutting down other processes before starting SoftWindows.</p> <p>If it is the <i>INSIGNIA</i> daemon that has not started, useful information may be found in the file <i>\$SWINHOME/FLEXlm/lmgrd.log</i>.</p>
<p>91: Failed to update the <i>/etc/inittab</i> file.</p>	<p>SoftWindows must update the file <i>/etc/inittab</i> to ensure that the licensing daemon starts when the workstation is booted. It was unable to do so.</p> <p>Edit the <i>/etc/inittab</i> file or another startup script to ensure that the licensing daemon is started when the workstation starts up. The SoftWindows line in <i>/etc/inittab</i> is:</p> <pre>isl:234:respawn:install/FLEXlm/lmgrd -c install/FLEXlm/license.dat >> install/FLEXlm/license.log 2>&1</pre> <p>where <i>install</i> is the SoftWindows installation directory.</p>
<p>92: Failed to update the license file.</p>	<p>SoftWindows was unable to create or modify the license file <i>\$SWINHOME/FLEXlm/license.dat</i>.</p> <p>The UNIX error message indicating the type of problem is displayed. This information should enable the system administrator to address the problem.</p>
<p>93: This version of the SoftWindows display driver cannot run in Enhanced mode. Please install the version supplied with SoftWindows.</p>	<p>The file <i>SPCMSWD.DVR</i> in your Windows installation is incompatible with the version of SoftWindows you are using.</p>

Table 13-1 (continued) Error Messages

	Update <i>SPCMSWD.DVR</i> to the version supplied with your SoftWindows distribution (<i>\$SWINHOME/windows</i>).
94: Too many programs EXEC'ing other programs. (Max depth:10)	<p>SoftWindows has a fixed limitation on the number of licensed MS-DOS applications which can be nested. This limit has been exceeded. This occurs when the application has been used to start another licensed MS-DOS application, which may be a copy of itself, which in turn starts another application, and so on.</p> <p>If there are several executables forming a single application which have all been licensed separately, licensing must be removed from one or more of the executables to enable the application to operate correctly.</p>
95: The license for this application is out of date.	<p>The expiry date for a licensed MS-DOS or Windows application has passed.</p> <p>Update the license for the application to have a new expiry date. Alternatively, restrict users from using that application, or that version of the application.</p>
96: All licensed copies of this application are already running.	<p>The maximum number of licensed copies of the MS-DOS or Windows application are already in use.</p> <p>User: Have another user of the MS-DOS or Windows application quit the application before you try to start it. Otherwise, contact your system administrator.</p> <p>Administrator: Update the license for the application to have a new maximum number of users. Depending on your reasons for licensing the application, this may require you to purchase further licenses from the application vendor.</p>

Table 13-1 (continued) Error Messages

97: Failed to update the /etc/rc.local file.	<p>Under SunOS 4.1.4 SoftWindows must update the file <i>/etc/rc.local</i> to ensure that the licensing daemon starts when the workstation is booted. It was unable to do so.</p> <p>Edit the <i>/etc/rc.local</i> file or another startup script to ensure that the licensing daemon is started when the workstation starts up.</p> <p>The required section in <i>/etc/rc.local</i> is of the form:</p> <pre># # Start up the SoftWindows FLEXlm license Server # if [-f %s]; then echo Starting SoftWindows FLEXlm license service server >/dev/console install/FLEXlm/lmgrd -c install/FLEXlm/license.dat logger -p auth.notice & fi</pre> <p>where <i>install</i> is the SoftWindows installation directory.</p>
98: Cannot overwrite the current C: drive.	<p>The filename entered for the new hard disk already exists and is being used as the C: drive.</p> <p>The C: drive hard disk file must not be overwritten in this manner. Select another filename for the new hard disk or use a different file for the C: drive when creating the hard disk.</p>
100: This exists and is a directory, please enter a file name.	<p>The name given for a new hard disk file exists and is a directory. Select another name for the new hard disk.</p>

Table 13-1 (continued) Error Messages

103: The environment variable SWINHOME points to an insecure installation. \$SWINHOME/sys.swinconfig must be owned by root and have the Set User ID bit set.	The SoftWindows system configuration file does not have correct ownership and permissions. This indicates that the SoftWindows installation has been copied or modified.
	Login as root on the workstation where SoftWindows is installed. Set ownership and permissions on the file as follows:
	cd \$SWINHOME
	chown root sys.swinconfig
	chmod 4644 sys.swinconfig
104: The SoftWindows processor has halted. Please Restart SoftWindows	An MS-DOS or Windows application has caused the emulated 80486 processor to enter a state in which it cannot process further instructions for example, an <i>HLT</i> instruction with all interrupts disabled. On a real PC this would lock up the PC.
	Restart SoftWindows from the Actions menu.
112: There is not enough space available in this file system to proceed with this operation.	There is insufficient space to backup the specified hard disk or increase the size of the specified hard disk.
113: The current C: drive has an out-of-date version. Choose Continue to update the disk.	SoftWindows has detected a hard disk that was created in a previous version of SoftWindows. If you update the disk, you will be unable to use it in the previous version of SoftWindows. If necessary, take a backup copy of the disk first.
114: This version of SoftWindows has no support for insupfd.vxd	You are running an old version of SoftWindows.
115: The specified WAV device is either invalid or unavailable. Please check the device name and try again.	

Table 13-1 (continued) Error Messages

117: The upgrade disk is incompatible with this version of SoftWindows	The file <code>\$SWINHOME/update.hdf</code> is incompatible with the running SoftWindows executable. Check that <code>\$SWINHOME</code> is set to the correct value.
1001: Unable to open Native Language Support catalog, defaulting to English.	SoftWindows cannot access the file. <code>\$SWINHOME/nls/C/swin.cat</code> . This file is the Native Language Support Catalog, required for SoftWindows messages. Verify that <code>\$SWINHOME/nls/C/swin.cat</code> is installed and readable by SoftWindows. If you have <code>LANG</code> set in your environment, set it to <code>C</code> before starting SoftWindows.
1004: The device specified is not a valid special character device.	The file name given as the CD-ROM device or comms port is not a character device. Verify that you have specified the correct device name.
1005: Command not found	SoftWindows cannot execute the UNIX command you have specified as a pipe command. Verify that the command name is spelled correctly, and that it has read and execute permissions. Verify that the command is accessible through the <code>PATH</code> set in your environment. If the command is not accessible, either modify the <code>PATH</code> before starting SoftWindows or specify the full UNIX path to the command in the SoftWindows Comms Port or Printer Port dialog box.

Table 13-1 (continued) Error Messages

1006: The file needed by the port adapter is already being accessed.	<p>The file name given for use with a comms port or printer port is already in use by a UNIX process and cannot be used by SoftWindows. This may occur if you have specified the same filename for more than one comms port or printer port or if you have another invocation of SoftWindows using the same filename.</p> <p>Close down the UNIX process using the file or select an alternative filename.</p>
1007: SoftWindows does not have access to the CDROM device name.	<p>The user does not have read permission for the CD-ROM device.</p> <p>Verify that you have read permission for the CD-ROM device. If necessary, use the UNIX <i>chmod</i> command to modify the permissions. Verify that you have specified the correct device name.</p>
1008: Your system is low on swap space. Continuing without increasing available memory may make programs fail unexpectedly.	<p>Increase the swap space or shut down some UNIX applications to increase the available memory.</p>
1009: Your system is running a version of OpenWindows prior to 3.0. SoftWindows is only supported on 3.0 and may behave incorrectly if you continue.	<p>The X server used to run SoftWindows is not supported by SoftWindows.</p> <p>Upgrade your X server to the recommended version or run SoftWindows on another display.</p>
1010: The UNIX command linked to a COM or LPT port has failed. All port operations are halted.	<p>The process being used for a comms port or printer port has died and no more data can be output to this process.</p> <p>Verify that the command being used is valid and that it is functioning correctly.</p>

Table 13-1 (continued) Error Messages

	<p>To verify the operation of commands being used to pipe comms or printer port information, it may be useful to first configure the comms or printer port to write to a file, output the required data (for example print data) to the file, then run the required pipe command at a UNIX shell prompt, using the file as input. This also allows you to examine the data in the file to verify that it appears as expected.</p> <p>Using this method, ensure that all of the data is flushed to the file. To do this enable automatic flushing from the Options menu, flush the port from the Actions menu, or exit SoftWindows.</p>
<p>1021: Unable to open the host's network interface.</p>	<p>The SoftWindows network driver has tried to access the host's low level networking device and has been unsuccessful. The network device is either not installed or SoftWindows does not have the correct permissions to open the device. SoftWindows will be unable to use PC networking if this error occurs.</p> <p>Verify that the host's network device is installed and configured correctly.</p> <p>Verify that no other UNIX applications are using the network device.</p> <p>Verify that the SoftWindows executable is owned by root and has the SUID bit set.</p>
<p>1022: Unable to configure the host's network interface.</p>	<p>The SoftWindows network driver has tried to configure the host's low level networking device and has been unsuccessful. SoftWindows will be unable to use PC networking if this error occurs.</p> <p>Verify that the host's network device is installed and configured correctly.</p> <p>Verify that no other UNIX applications are using the network device.</p>

Table 13-1 (continued) Error Messages

1023: Unable to enable packet filtering.	<p>Verify that the SoftWindows executable is owned by root and has the SUID bit set.</p> <p>The SoftWindows network driver could not enable the low level network packet filtering algorithms needed. SoftWindows will be unable to use PC networking if this error occurs.</p> <p>Verify that the host's network device is installed and configured correctly.</p> <p>Verify that no other UNIX applications are using the network device.</p> <p>Verify that the SoftWindows <i>NET.CFG</i> file has no illegal PROTOCOL entries.</p>
1024: Unable to flush the host's network interface.	<p>The SoftWindows network driver could not flush the low level network device. SoftWindows may not be able to use PC networking if this error occurs.</p> <p>Verify that the host's network device is installed and configured correctly.</p> <p>Verify that no other UNIX applications are using the network device.</p>
1025: Unable to read the host's network address.	<p>The SoftWindows network driver could not access the host's network address. SoftWindows will be unable to use PC networking if this error occurs.</p> <p>Verify that the host's network device is installed and configured correctly.</p> <p>Verify that no other UNIX applications are using the network device.</p> <p>Verify that the SoftWindows executable is owned by root and has the SUID bit set.</p>

Table 13-1 (continued) Error Messages

<p>1026: Unable to enable a SIGIO handler.</p>	<p>The SoftWindows network driver could not redirect the host's SIGIO interrupt vector. SoftWindows can be used to access PC networks if this error occurs, but the overall networking performance will be poor.</p> <p>Verify that the host's network device is installed and configured correctly.</p> <p>Verify that no other UNIX applications are using the network device.</p>
<p>1027: Unable to bind to the host's network provider.</p>	<p>The SoftWindows network driver has tried to configure the host's low level networking device but has been unsuccessful. SoftWindows will be unable to use PC networking if this error occurs.</p> <p>Verify that the host's network interface is installed and configured correctly.</p> <p>Verify that no other UNIX applications are using the network device.</p> <p>Verify that the SoftWindows executable is owned by root and has the SUID bit set.</p>
<p>1028: Unable to attach to the host's network provider.</p>	<p>The SoftWindows network driver has tried to configure the host's low level networking device and has been unsuccessful. SoftWindows will be unable to use PC networking if this error occurs.</p> <p>Verify that the host's network interface is installed and configured correctly.</p> <p>Verify that no other UNIX applications are using the network device.</p> <p>Verify that the SoftWindows executable is owned by root and has the SUID bit set.</p>

Table 13-1 (continued) Error Messages

1029: Unable to enter host network's promiscuous SAP mode.	<p>The SoftWindows network driver could not enter Promiscuous SAP mode. SoftWindows will be unable to use PC networking if this error occurs.</p> <p>Verify that the host's network device is installed and configured correctly.</p> <p>Verify that no other UNIX applications are using the network device.</p> <p>Verify that the SoftWindows executable is owned by root and has the SUID bit set.</p>
1030: Unable to retrieve the host interface's physical location (PPA).	<p>The SoftWindows network driver could not find the correct network device to use. SoftWindows will be unable to use PC networking if this error occurs.</p> <p>Verify that the host's network device is installed and configured correctly.</p> <p>Verify that no other UNIX applications are using the network device.</p> <p>Verify that the SoftWindows executable is owned by root and has the SUID bit set.</p>
1031: Unable to close host's network interface.	<p>The SoftWindows network driver could not close the host's network device. SoftWindows may not be able to use PC networking when next used.</p> <p>Verify that the SoftWindows executable is owned by root and has the SUID bit set.</p>
1032: Unable to add protocol to network interface.	<p>The SoftWindows network driver could not assign the requested protocol. SoftWindows will be unable to use PC networking if this error occurs.</p>

Table 13-1 (continued) Error Messages

	<p>Verify that the SoftWindows <i>NET.CFG</i> file has no illegal PROTOCOL entries.</p> <p>If using the SoftWindows ODI driver, verify that the SoftWindows <i>NET.CFG</i> file has no illegal PROTOCOL entries.</p> <p>Verify the supported protocols for this SoftWindows platform.</p> <p>Verify that no other UNIX applications are using the network device.</p>
<p>1033: Unable to delete protocol from network interface.</p>	<p>The SoftWindows network driver could not remove the previously assigned protocol. SoftWindows may not be able to use PC networking when next used.</p> <p>If using the SoftWindows ODI driver, verify that the SoftWindows <i>NET.CFG</i> file has no illegal PROTOCOL entries.</p> <p>Verify that the SoftWindows <i>NET.CFG</i> file has no illegal PROTOCOL entries.</p> <p>Verify the supported protocols for this SoftWindows platform.</p> <p>Verify that no other UNIX applications are using the network device.</p>
<p>1034: Unable to transmit packet onto network cable.</p>	<p>The SoftWindows network driver could not transmit a packet onto the network. SoftWindows may be unable to use PC networking if this error occurs.</p> <p>Verify that the SoftWindows executable is owned by root and has the SUID bit set.</p> <p>Verify that the host's network device is configured correctly.</p> <p>Verify that no other UNIX applications are using the network device.</p> <p>Verify that the protocol that you are using is supported by SoftWindows on this platform.</p>

Table 13-1 (continued) Error Messages

1035: Partial packet received from host's network interface.	The SoftWindows network driver did not receive a full packet when one was expected. Network based files/data may become corrupted if this error occurs.
	Verify that the SoftWindows executable is owned by root and has the SUID bit set.
	Verify that the host's network device is configured correctly.
	Verify that no other UNIX applications are using the network device.
1036: Unable to enter promiscuous mode.	The SoftWindows network driver could not enter Promiscuous mode. This could be due to a limitation of the host's network device, or a runtime system error. SoftWindows can continue to use PC networking, but the application which requested promiscuous mode may not work as expected.
	Verify that the SoftWindows executable is owned by root and has the SUID bit set.
	Verify that the host's network device is configured correctly.
	Verify that no other UNIX applications are using the network device.
1037: Unable to exit promiscuous mode.	The SoftWindows network driver could not leave Promiscuous mode. SoftWindows can continue to use PC networking, but the overall networking performance will be poor.
	Verify that the SoftWindows executable is owned by root and has the SUID bit set.
	Verify that the host's network device is configured correctly.
	Verify that no other UNIX applications are using the network device.

Table 13-1 (continued) Error Messages

<p>1038: Unable to add multicast address.</p>	<p>The SoftWindows network driver could not assign the requested multicast address. SoftWindows can continue to use PC networking but the application which requested the particular multicast address may not work as expected. This could be due to the multicast address already being enabled, or to a general inability to assign these addresses.</p> <p>Verify that the SoftWindows executable is owned by root and has the SUID bit set.</p> <p>Verify that the host's network device is configured correctly.</p> <p>Verify that no other UNIX applications are using the network device.</p>
<p>1039: Unable to delete multicast address.</p>	<p>The SoftWindows network driver could not remove the requested multicast address. SoftWindows can continue to use PC networking but will continue to receive all packets for that particular multicast address.</p> <p>Verify that the SoftWindows executable is owned by root and has the SUID bit set.</p> <p>Verify that the host's network device is configured correctly.</p> <p>Verify that no other UNIX applications are using the network device.</p>
<p>1040: The TCP port used for communication between SoftWindows and the FLEXlm license manager is already in use. Select OK to choose a different port number or abort the license installation. If you Continue with license installation, FLEXlm may not operate correctly without further action to release the required TCP port.</p>	<p>The TCP port address 744 is reserved for communication between FLEXlm clients and servers. This means that this message is most likely to be caused by a copy of <i>lmgrd</i> running from another license file. Use the <i>ps</i> command to identify this.</p>

Table 13-1 (continued) Error Messages

	<p>Occasionally, another process may use this TCP port. If you cannot control the port used by the other process you may be able to avoid the conflict by selecting Continue, moving the resulting entry in <i>/etc/inittab</i>, or <i>/etc/rc.local</i>, to an earlier position, and rebooting the machine.</p> <p>Alternatively, you can use the Advanced button on the License Manager dialog box to change the TCP port number. This should only be done with the agreement of your network administrator.</p> <p>If this conflict is not resolved <i>lmgrd</i> will repeatedly write the error message:</p> <p>Retrying socket bind (address in use: port <i>xxx</i>) to <i>\$SWINHOME/FLEXlm/lmgrd.log</i>.</p>
1041: TurboStart save has failed.	<p>SoftWindows failed to save the Turbostart data file in the directory specified. Check the permissions in the directory.</p>
1042: Cannot use TurboStart while Auto Freeze is active. Please disable Auto Freeze and try again.	<p>See the User's Guide for instructions on turning off Auto Freeze.</p>
1043: Cannot use TurboStart while Freeze is in effect. Please turn Freeze off and try again.	<p>See the User's Guide for instructions on turning off Freeze.</p>
1044: The TurboStart Resource file is invalid.	<p>The resource file <i><path>/tsrf.<disk name></i> (where <i><path></i> is the path to the directory containing the hard disk file, and <i><disk name></i> is the name of the hard disk) is corrupt or does not exist.</p>
1045: The TurboStart Resource File for the X: drive is owned by another user.	<p>The resource file <i><path>/tsrf.<disk name></i> (where <i><path></i> is the path to the directory containing the hard disk file, and <i><disk name></i> is the name of the hard disk) is owned by another user.</p>

Table 13-1 (continued) Error Messages

<p>1046: If there is sufficient disk space, SoftWindows will create the hard disk file below, and boot from this as a new C: drive. This will be a 180MB PC disk.</p>	<p>This message commonly occurs when running SoftWindows for the first time. The C: drive setting in your configuration file is empty, and SoftWindows cannot find a hard disk file called WIN95-username.hdf in your home directory. Press Continue to create a new hard disk file in your home directory, or press Exit to exit from SoftWindows.</p>
<p>1048: The TurboStart Resource File for the C: drive is owned by different user ID.</p>	<p>The resource file <i><path>/.tsrf.<disk name></i> (where <i><path></i> is the path to the directory containing the hard disk file, and <i><disk name></i> is the name of the hard disk) is owned by another user.</p>
<p>1049: The TurboStart Resource File for the C: drive was created on a different machine.</p>	<p>To use the saved Turbostart file, run SoftWindows on the same machine on which the Turbostart file was saved.</p>
<p>1050: The TurboStart Resource File for the D: drive was created on a different machine.</p>	<p>To use the saved Turbostart file, run SoftWindows on the same machine on which the Turbostart file was saved.</p>
<p>1051: The TurboStart Resource File for the C: drive was created using a different SoftWindows executable.</p>	<p>To use the saved Turbostart file, run the same version of SoftWindows as the one on which the Turbostart file was saved.</p>
<p>1052: The TurboStart Resource File could not be deleted.</p>	<p>The resource file <i><path>/.tsrf.<disk name></i> (where <i><path></i> is the path to the directory containing the hard disk file, and <i><disk name></i> is the name of the hard disk) could not be deleted. Check that you have write permissions in the directory.</p>
<p>1053: The TurboStart Resource File could not be created. TurboStart will work but your hard disk file is NOT protected against use by other users. Check permissions on directory containing hard disk file. Problem file : filename.</p>	<p>The resource file <i><path>/.tsrf.<disk name></i> (where <i><path></i> is the path to the directory containing the hard disk file, and <i><disk name></i> is the name of the hard disk) could not be created. Check that you have write permissions in the directory.</p>

Table 13-1 (continued) Error Messages

1054: SoftWindows Turbostart has encountered a problem.	This error message is displayed when SoftWindows encounters a problem creating or using a Turbostart file. The message is further qualified with more specific information. Press Continue to run SoftWindows without the Turbostart file.
1055: SoftWindows was unable to obtain a license. Select continue to install one.	See Licensing SoftWindows for instructions on installing licenses.

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