SoftWindows™ 95 Administrator's Guide

Document Number 007-3221-004

Contributors

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About This Guide

About SoftWindows Help

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

- This SoftWindows 95 Administrator's Guide describes how to install 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. This guide also includes an appendix with information specific to using the Japanese version of SoftWindows.
- A separate *SoftWindows 95 User's Guide* provides the information you need to use SoftWindows on your Unix workstation.

There are two ways to access the SoftWindows Guides:

- You can find both of these guides online. To access them:
 - 1. Choose Online Books from the Help toolchest.
 - 2. In the InfoSearch browser, click SGI_Admin.
 - 3. Click the title of the book you want to view.
- For quick access to online help, use the Help pull-down menu from the SoftWindows application window. The Help menu does not represent the full SoftWindows Guide contents, but is a convenient way to get help on many commonly sought-for topics.

About the Administrator's Guide

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 FLEXIm licensing system and explains how to use the SoftWindows built-in licensing function to modify a license.
- Chapter 7, "Configuring SoftWindows"—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, "Licensing MS-DOS and Windows 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.

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.
- Some commands that you type in a UNIX shell are preceded by % for a C shell or \$ for a Bourne or Korn shell. You need to press *Enter* at the end of each command. Don't type the % or \$.

Many commands are common to the C, Bourne Korn shell. In this case, the command is introduced with %.

Abbreviations

This guide uses the following abbreviations:

Table i Abbreviations

This abbreviation	Refers to this
SoftWindows	SoftWindows 95 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

Technical support

Insignia Solutions is committed to helping you get the most out of your software. As a registered customer of Insignia Solutions you are entitled to free warranty support for your Insignia products.

Insignia Solutions offers various types of product support programs beyond the initial 30 days of free warranty technical support. In addition to providing technical support, these support programs include options to automatically receive product upgrades and maintenance releases when they become available.

Before you call technical support please follow this pre-call checklist so that our technicians can help you as effectively and efficiently as possible:

- 1. Consult the documentation included with your product. It should provide answers to the majority of your questions.
- 2. Use your machine's serial number as the software serial number requested by technical support. You can use the *lmhostid* command to view your serial number. (Enter lmhostid at a command prompt in a Unix shell window.)
- 3. Prepare the following information, which may be helpful:

Host computer

- Workstation model, memory, and keyboard type.
- Operating system version.
- Printer type and interface, if the problem relates to printing.
- Networking information.

SoftWindows configuration

- The SoftWindows settings, as contained in your "swinconfig" file.
- Listings of AUTOEXECBAT and CONFIGSYS.

Application

- The application name and version number.
- Any error messages produced by either SoftWindows or the application.
- Details of where the application was running from; for example, floppy disk drive, hard disk file, or FSA drive.
- Whether the drive is local or on a network.
- Whether the problem is repeatable or random.

Technical support USA/Canada

Phone: (408) 327-6500 Fax: (408) 327-6343

Fax response: (800) 876-3872 AppleLink: INSIGNIA.TCH

Internet: unixtech@isinc.insignia.com

World Wide Web: http://www.insignia.com/

Technical support is available from 6am through 5pm, PST, Monday through Friday.

Europe, Middle East, Africa, and CIS countries

Phone: +44 131 451 6900 Fax: +44 131 451 6910

Internet: support@isltd.insignia.com

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Replacement CD-ROMs are available only if your Warranty Registration Card is on file. A charge will apply in some circumstances.

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Internet: unixcs@isinc.insignia.com

Customer service is available from 6am through 5pm, PST, Monday through Friday.

Europe, Middle East, Africa, and CIS countries

Phone numbers:

UK: 0800 667706 France: 0590 8201 Germany: 0130 81 40 90 Italy: 1678 77164

Netherlands: 060 225531 Sweden: 020 791480 Rest of region: +44 131 458 6849

Fax: +44 131 451 6981

Internet: info@isltd.insignia.com

or contact your local software supplier.

Customer service is available from 9am through 5pm, UK time, Monday through Friday.

In other countries customer service is provided through the authorized dealer in your country.

For more information

In addition to the information provided in the *SoftWindows 95 User's Guide* and *SoftWindows 95 Administrator's Guide*, you also have access to a variety of information about SoftWindows via fax, phone, and the World Wide Web.

Insignia's World Wide Web server

Insignia Solutions provides SoftWindows technical information via Insignia's World Wide Web server on the Internet and Insignia's fax response service.

Use a Web browser to connect to the server at:

http://www.insignia.com

This server is maintained by Insignia Solution's Technical Support Group to provide the most up-to-date information on SoftWindows for Unix subjects such as printing, container files, FSA drives, the SoftWindows licensing system, networking, and the use of peripheral devices under Unix.

Insignia's fax response service

Insignia provides a fax response service for users who do not have access to the Internet. Users can request a subset of the documents found on Insignia's World Wide Web server using a touch tone telephone, fax machine, and Insignia's fax back server.

To use the fax response service, call the following telephone number using a touch-tone phone:

Toll-Free: 1-800-876-3872 (only in USA)

Toll: (415) 327-6295

Silicon Graphics 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 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 Silicon Graphics and others.

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 a PC, Unix, and Macintosh platforms, throughout the organization.

Features of SoftWindows 95

80486 processor emulation

SoftWindows 95 provides full emulation of the Intel 80486 processor, enabling users to exploit the full functionality of current PC software.

Among the features provided by this emulation are:

- The ability to run Windows 95
- Continued support for OLE 2.0
- Multiple MS-DOS sessions
- 32-bit memory addressing
- Support for virtual device drivers

Advanced emulation technology

Insignia Solutions has made further improvements to the performance of its 80486 emulation technology, with particular attention to the execution of Windows 95. The result is that SoftWindows 95 runs faster than SoftWindows 2.

The 486 processor emulation at the heart of SoftWindows 95 uses a combination of interpretation, dynamic compilation, and static compilation of the Intel instructions.

Interpretation

The Intel 80486 instructions are read sequentially and translated into the host RISC instructions.

Dynamic compilation

Frequently executed Intel code segments are identified and compiled into RISC code segments. The compiled segments are then cached and run directly whenever the Intel segments are executed.

Static compilation

Frequently used Intel code (such as portions of Windows) is optimally compiled into RISC code and built into the SoftWindows product. When this code is called, the RISC version runs directly without any interpretation or compilation overhead.

This technology, together with an in-depth understanding of the Windows source code, has resulted in a highly efficient emulation of this complex processor.

Platform-specific optimization

The SoftWindows technology has been designed as a cross-platform solution, to allow it to be ported to several different RISC architectures and platforms. After porting the core technology to a new architecture, SoftWindows is tuned for optimum performance.

The design of the 80486 processor emulation has evolved to encompass the performance features of today's latest RISC processors. Moreover, each version of SoftWindows exploits the best hardware and operating system features of the MIPS architecture and Silicon Graphics IRIX.

Network support

SoftWindows provides networking support as though the SoftWindows user were running their programs on PC hardware. The SoftWindows user is shielded from the complexity of running PC networking software in an emulation environment on a Unix host.

A number of solutions are built in to address the variety of networking software that may be running on a PC and the network. More than one networking protocol can be used at the same time.

SoftWindows networking architecture

SoftWindows networking is based on the Open Datalink Interface (ODI) standard, which enables multiple transport protocols to be used simultaneously. Insignia Solutions' ODI-compliant network drivers communicate with the host workstation's network interface.

Figure 1-1 and Figure 1-2 show how MS-DOS and Windows applications communicate via different network software in PC hardware and SoftWindows environments, respectively.

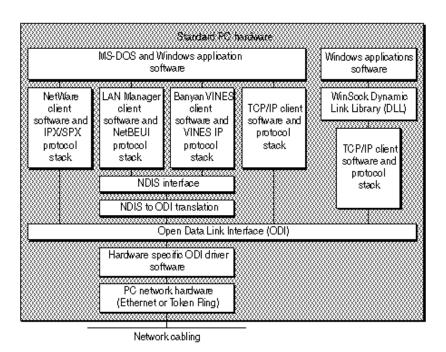


Figure 1-1 PC applications running on standard PC hardware

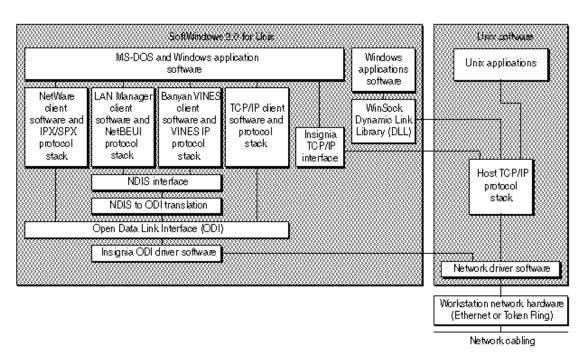


Figure 1-2 PC applications running within SoftWindows 95

Winsock Dynamic Link Library

Winsock is a high level API for accessing TCP/IP networks from Windows applications.

Being a publicly available standard Winsock removes the need for applications to be coded for specific third party TCP/IP software implementations on the PC. It is therefore being rapidly adopted by application developers and network software vendors.

SoftWindows includes a Winsock-compliant DLL which communicates directly with the TCP/IP protocol stack in the host Unix system, resulting in a more efficient implementation of Winsock. This WINSOCKDLL is pre-installed, leaving only the application software to be configured.

Additional new features in SoftWindows 95

Cut and paste

SoftWindows supports copying and pasting between Windows applications and host Unix applications to include bitmap graphics. This enables graphics available in one environment to be used in the other. For example:

- A view of a rendered model created in a Unix modeling application can be copied and pasted into a report written in Microsoft Word within SoftWindows.
- Commercially available clip art from a PC format CD-ROM can be copied and pasted into a Unix application.

Configuration

SoftWindows is user-configurable through menu options and dialog boxes.

SoftWindows also allows a system administrator to disable the user configuration feature and to implement SoftWindows as a secure system for running one or more specific PC applications.

The security features included in the secure implementation are:

- Motif menus are disabled.
- Booting from floppy disks is disabled. Floppy disks may still be used for reading and writing data.
- Selected keys are disabled at boot time to ensure boot sequence is always fully completed.
- Selected keys are permanently disabled to prevent users from exiting to MS-DOS.

Application licensing

SoftWindows includes tools which allow Windows and MS-DOS applications to be placed underdemo, nodelock, or concurrent-use license control. This is achieved through the FLEXIm license server used to license the SoftWindows application.

A PC-based license generator program enables licenses for any PC application to be generated with options for specifying start date, expiration date and number of concurrent users.

Application licensing allows you to ensure compliance with PC software licensing agreements, or as a tool for managing in-house software maintenance, where start and expiration dates can be used to ensure consistent versions across an organization.

Together with the security configuration options already described, this feature gives the administrator an extra level of control over PC software compared with that currently available on PC hardware.

Language

SoftWindows is supplied with an installation option for selecting which language version of MS-DOS and Windows to use. Language options currently supplied are English, French, and German.

Installation

A CD-ROM contains the installation software and versions of SoftWindows for your Silicon Graphics workstation. Use Software Manager or "inst" to install the files from the CD-ROM.

Once the CD-ROM is mounted, on-line help is available to assist the installation procedure.

The SoftWindows installation includes complete versions of Windows and DOS for each user on your workstation.

New features in SoftWindows

SoftWindows 95 provides the following enhancements and extensions to SoftWindows 2.0.

Windows 95

SoftWindows 95 includes Windows 95, the latest version of Windows from Microsoft. SoftWindows 95 is optimized for Windows 95 performance.

TurboStart

SoftWindows 95 includes Insignia's TurboStart™ feature which loads Windows 95 instantly, and lets you resume work in your Windows applications where you left off in your last session.

Dynamic resizing

SoftWindows 95 now allows the Windows desktop to be resized dynamically, so that the change takes effect immediately, without restarting.

Sound and video support

SoftWindows 95 provides drivers for *wav* sound files and *avi* video files, so that users can play sounds and videos from Windows using the workstation hardware. SoftWindows 95 also supports MIDI input and output.

24-bit graphics

SoftWindows 95 allows users to cut and paste 24-but true color images between Unix applications and Windows 95.

Long file names

SoftWindows now supports Windows 95 long filenames on VFSA, but not FSA. This allows filenames to be preserved when copying files between Windows 95 and Unix via FSA drives.

Automatic hard disk upgrading

SoftWindows automatically detects if the hard disk file being used as the C: drive was created by an earlier version of SoftWindows, and updates the disk with the latest drivers. In addition, a Windows3.11 2.0 disk is automatically upgraded to Windows95.

Installation requirements

This section specifies the hardware and software required to run the version of SoftWindows for SGI workstations.

System software

IRIX 6.3 or later.

Hardware

Silicon Graphics systems that use the R4000 or later processors, including Indigo 2 , Indy, and O^2 .

The R2000 and R3000 series are not supported by SoftWindows.

The recommended minimum CPU is a 133Mhz R4600SC.

Memory

48 Mbytes minimum.

Disk space

About 90 Mbytes are required to install SoftWindows.

SoftWindows hard disk files are a minimum size when created, and expand as data is written to them. For example, a 59 Mbyte bootable Windows disk will initially be 17 Mbytes but will expand to 59 Mbytes per user when full.

Swap space

The swap space should be at least three times the physical memory size, or 144 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 to have a compatible CD-ROM drive connected to your workstation.

Keyboards

All SGI, US, UK, French, and German keyboards are supported.

Network devices

Network devices supplied by Silicon Graphics are supported.

Installation

This chapter describes how to install SoftWindows. Note that SoftWindows may be pre-installed on your system, and may have either a permanent license or a time limited trial license already installed. If the SoftWindows icon appears in your Applications Icon Catalog page, then SoftWindows has been pre-installed and you will most likely not need any of the information in this chapter.

To install SoftWindows, you need one of the following activation licenses:

Table 3-1 Licenses

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 license	Allows users to run SoftWindows for an unlimited time period on a single system.

To install a demonstration or concurrent license you need to:

- 1. Install SoftWindows.
- 2. Find your license server FLEXIm HostID and server name; refer to "Hostids for FLEXIm-supported machines" in Chapter 6. Complete the warranty card and mail or fax it to Insignia Solutions using one of the following numbers:
 - USA users: (408) 327-6343
 - European users:(+44) (131) 451-6981

Insignia Solutions will then provide your authorization code.

3. Install your license.

This chapter describes each of these procedures in detail.

Before you install

Before installing SoftWindows, you need to have either a network connection to a machine with the installable image online or a CD-ROM drive accessible from your workstation. If necessary, refer to your system's documentation for information on how to do this.

The installation process also requires:

- At least 90 Mbytes of disk space.
- At least 48 Mbytes of physical memory. The performance of SoftWindows will be improved with more memory. 64 Mbytes are recommended.

It is recommended that at least three times the physical memory be allocated to the swap space, about 144 Mbytes.

Installing SoftWindows

To install SoftWindows from the CD-ROM, follow these steps:

- 1. Insert the CD-ROM into the drive.
- 2. Choose Software Manager from the System toolchest.
- 3. Drag the icon for the CD-ROM into the Available Software drop pocket; you may need to click the Lookup button.
- 4. To perform a default installation, click the *Start* button.

To perform a custom installation:

- Click *Customize Installation* in the Software Manager.
- Choose "Subsystems Only" from the Software menu to display the SoftWindows subsystems.
- Click to place a checkmark in the *Install* box next to each subsystem that you want to install.
- Click the *Start* button.
- 5. Once the installation is complete, log out and log in again as a user to make the changes to the system files take effect.

To install SoftWindows from a software distribution on a remote system on the network, follow these steps:

- 1. Choose Software Manager from the System toolchest.
- 2. Click in the *Available Software* field and type the remote system's hostname, a colon (:), and the full pathname of the directory that contains the SoftWindows software.

For example, to specify a directory named /dist on a system named mars, enter mars:/dist

- 3. Click the *Lookup* button.
- 4. To perform a default installation, click the *Start* button.

To perform a custom installation:

- Click Customize Installation in the Software Manager.
- Choose "Subsystems Only" from the Software menu to display the SoftWindows subsystems.
- Click to place a checkmark in the *Install* box next to each subsystem that you
 want to install.
- Click the *Start* button.
- 5. Once the installation is complete, log out and log in again as a user to make the changes to the system files take effect.

For more information about installing software, see Chapter 4, "Installing and Removing Software," in the *Personal System Administration Guide*.

Licensing SoftWindows

If SoftWindows has not yet been licensed, the SoftWindows license manager dialog box will be displayed. This allows you to enter the licensing details for your copy of SoftWindows.

To license SoftWindows

1. If you do not already have an authorization code, complete your warranty card, including your serial number, FLEXlm HostID, and server name, and mail or fax it to Insignia Solutions using one of the following numbers:

USA users: (408) 327-6343

European users: (+44) (131) 451-6981

Insignia Solutions will then contact you with your authorization code.

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

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

Table 3-2License Sheet

Field	What you enter/select
Type Of License	Demonstration, concurrent, or nodelock.
Serial Number	A serial number in the form: 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 by Insignia in the form Day, Month, Year for example: 15, 12, 1993 or: 1,1,0 (for concurrent licenses).
Authorization Code	The 20-character authorization code supplied by Insignia; made up from the characters 0-9 and A-F (in upper case) with no spaces between the characters.

3. Click *Install License* to install the license.

You can now run SoftWindows as described in the section "Running SoftWindows," of the *SoftWindows 95 User's Guide*.

Setting up SoftWindows for each user

Once SoftWindows has been installed on the system, you need to set up the environment for each user who wants to use SoftWindows. SoftWindows includes a script to do this automatically. You may prefer instead to set up the environment manually. These alternatives are described in the following sections.

To set up SoftWindows Automatically

SoftWindows automatically configures your system in a number of ways:

- A number of environment variables are defined, as listed in the following section.
- SoftWindows is set up so that it can be run from the X Windows menu.
- The X server is set up so that it does not intercept certain key combinations, such as *Alt-F4*, which are used by Microsoft Windows.

The following lists the files altered:

- .Xdefaults
- .4Dwmrc

Note: The *user_env.sw* script appends items onto the end of the above files, and if there is an exit in the *.login* or *.profile* files, the SoftWindows environment may not get set up correctly. In this case you will need to manually edit the *.login* or *.profile* file. The *user_env.sw* script resides in the */usr/lib/SoftWindows/bin/scripts* directory by default.

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 FLEXIm 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 FLEXIm

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

For a C shell, enter

```
setenv LM_LICENSE_FILE 744@myserve at the command prompt in a Unix shell window.
```

• For a Bourne or Korn shell, enter these two lines

```
LM_LICENSE_FILE=744@myserve
export LM_LICENSE_FILE
at the command prompt in a Unix shell window.
```

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 then you do not need to set SWINHOME.

Troubleshooting

Licensing problems (FLEXIm)

If you get a licensing error when starting SoftWindows, you should proceed as follows on the license server:

1. Check that the *lmgrd* daemon is running by entering

```
ps -efl | grep lmgrd
```

at the command prompt in a Unix shell window.

2. Check the data in the *license.dat* file.

Does the *SERVER* line point to the license server? Is there a *DAEMON* line pointing to the *insignia* daemon? If not, either edit the file or re-run SoftWindows as *root* on the licensing server, and choose *Licensing* from the *Actions* menu. See "Licensing SoftWindows," for more information.

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 with "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* is used rather than the .*login*.

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, and the fonts installed in the SoftWindows installation are not usable by the X server. To resolve this problem, you need to compile the SoftWindows fonts for your particular X terminal with commands such as:

```
% xset +fp install/fonts/SGI
% xset fp rehash
% xset fp default
```

where *install* 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* files does not already exist, create it and insert these commands.

Setting up SoftWindows

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

You set up SoftWindows emulation using the functions available in the SoftWindows *Options* menu.

- Use *Memory*... to set up the amount of memory 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 a PC display adapter.

These functions are described in greater detail on the following pages.

Caution: You must restart SoftWindows when you change any of the preferences in the Options menu, except in the case where you change an FSA drive.

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

Setting up memory

SoftWindows allows you to set the main memory size to between 1 Mbyte and 32 Mbytes. The initial setting is 8 Mbytes, which is the minimum recommended value for running Windows.

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 CONFIGSYS 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.

The upper limit of the Memory dialog box can be set to any value up to 32 Mbytes.

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.

Table 4-1Drive Letters Setup

Drive	Default	Description
A:	Empty	The floppy disk drive
B:	Empty	Additional floppy disk drive
C:	WIN95-username.hdf	The start-up, or boot, hard disk drive
D:	Empty	Additional hard disk drive or a CD-ROM drive

 Table 4-1 (continued)
 Drive Letters Setup

Drive	Default	Description
E:	\$HOME	Your Unix home directory
H:	\$HOME	Your Unix home directory

You use the *Open Drive*... function on the *Disk Drives* cascade menu on the *Options* menu to set up the floppy disk drives A: and B, the hard disk drives C: and D, the FSA drives E: to Z; and the CD-ROM drive F.

Setting up hard disk files

SoftWindows emulates PC hard disks using single files in the Unix file system with the extension "hdf". The individual MS-DOS 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 MS-DOS start-up files which are installed when the hard disk file is created.

To create a new D: drive

- 1. First make sure that you have enough hard disk space for the file you are creating. You can enter the Unix "df" command at a command prompt to check this.
- 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. To create a blank D: drive, select the "empty hard disk" checkbox.
- 6. Choose OK to create the hard disk file you have specified.

SoftWindows formats the drive and installs the MS-DOS and Insignia utility files you will need if you want to use the drive as a boot drive on C. It also installs the files needed to run Windows in a network configuration.

Note: If you intend to install a standard Windows configuration on your new drive you should ensure that the hard disk size is at least 80 Mbytes.

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

To create a new C: drive

- 1. Follow the procedure for creating a new D drive; refer to "To create a new D: drive."
- 2. When the D drive has been created choose *Open Drive...* from the *Disk Drives* cascade menu on the *Options* menu.
- 3. Remove the *Hard Disk Drive C: File Name...* entry and replace it with the *Hard Disk Drive D: File Name...* entry.
- 4. 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.
 - 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.
- 3. Choose the name of the file you want to use and click *OK* to restart SoftWindows with the drive configuration you have specified.

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. Click *OK* to restart SoftWindows with the drive configuration you have specified.
- 4. To permanently remove the hard disk file for D, use the Unix rmcommand.

To increase the size of the C: drive

- 1. Start SoftWindows.
- 2. Choose Modify Drive from the Disk Drives cascade menu on the Options menu
- Use the slider bar to set the size for the new hard disk file.Make the file as large as you want the new C drive to be.
- 4. Choose OK to create the hard disk file

Note: You must have sufficient space on your Unix file system for this to work. These instructions assume you are using the default hard disk file and you are running as root (or as a user with write permission to \$SWINHOME).

Setting up VFSA drives through Unix

SoftWindows allows you to share files between MS-DOS and Unix by setting up selected Unix directories as MS-DOS drives. The drives are set up using the MS-DOS File Sharing Architecture, and are referred to as FSA drives.

The term VFSA is relevant only to drives that can be accessed in Window95 and show long filenames. In DOS, these shared files are called FSA, where the only exception is if you look at a network drive from the DOS prompt in Windows95.

You can set up FSA drives using the *Open Disk Drives* dialog box.

Alternatively, you can set up FSA drives using the MS-DOS NET USE command.

Drive letters

The number of drives available is determined by the value of LASIDRIVE in the CONFIGSYS file. The default setting, LASIDRIVE=K, makes drives up to K: available. (LASIDRIVE is used only it is needed from the DOS prompt in Windows95.)

The FSADRIVE command specifies which drives you want to use as FSA drives. By default drives E and H are made available as FSA drives. If you need additional shared folders, you should increase the value of LASIDRIVE, and specify additional drives after the FSADRIVE command.

For example:

C:\INSIGNIA\FSADRIVE L: M:

Alternatively, you can use the NET USE command. Refer to "To set up Unix directories as FSA drives using NET USE."

Note: Using the FSADRIVE command will also make the drives available in the *Open Disk Drives* dialog box.

To view the Unix directories set up as FSA 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 FSA drive, drive E.
- 2. Click the up-arrow or down-arrow to step through the available FSA drives. In each case the text box shows the directory assigned to the selected drive.

To change the Unix directory assigned to an FSA drive

- 1. Click the up-arrow or down-arrow to select the FSA 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 FSA drive.
- 3. Locate the directory you want to use and click *OK*.
- 4. Click *OK* to exit from the *Open Disk Drives* dialog box with the drive configuration you have specified.

To set up Unix directories as FSA drives using NET USE

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

```
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:

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

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

When the NET USE command is used to configure an FSA 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 E for the third, and so on. In this case you need to use subsequent letters for any FSA drives you set up.

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

To remove a Unix directory from a drive

Type the following command at the C\> prompt:

```
NET USE X: /D
```

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

To set up a temporary FSA drive

If you want to use the NET USE command to temporarily assign an FSA drive while you run your program, you can deassign the FSA drive when the program has run.

For example, to configure an FSA drive only while running the program MY_PROGEXE, you could use a batch file containing the following lines:

```
REM Drive I: is originally unassigned
NET USE I: $HOME/my_data
MY_PROG.EXE
NET USE I: /D
```

To list the Unix directories attached to drives

Type the following command at the C\> prompt:

```
NET USE
```

This will list the PC drive letter of each FSA 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.

filename mapping

PC filenames are not case sensitive, so upper and lower case letters are treated the same. You can choose how files are saved to FSA drives. To do this, select the required option from the *Host File Names Are*: pop-up menu in the Open Disk Drives dialog box.

The options are:

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

Setting up VFSA drives through Windows95

You can dynamically set up VFSA drives through the Windows95 interface. This allows you to avoid having to restart SoftWindows; the new drives immediately appear in your My Computer window.

To set up your VFSA drive:

- 1. Click the My Computer icon to highlight it
- 2. Click the right mouse button, then select "Map Network drive"
- 3. Use the up and down arrows to select your desired drive letter
- 4. In the PATH field, enter the mapping that you wish. The command should be of the form:

\\FSA\/usr/vpc/qa

5. Click OK.

Your new drive immediately appears in your window.

If you wish to change the path of the drive in the interface, the information will not be updated in Windows95 immediately. After you have made the change,

- 1. Click the My Computer icon to highlight it
- 2. Choose Refresh from the View menu in the taskbar.

This refreshes the display and updates the information.

Setting up floppy disk drives

SoftWindows automatically attempts to set up the standard internal or external 3.5-inch floppy disk drives on your workstation as the PC drives A: and/or B: to work with MS-DOS format 3.5-inch floppy disks..

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* in the Open Disk Drives dialog box as appropriate.

Setting up the CD-ROM

SoftWindows allows you to read CD-ROMs which are compatible with the Microsoft CD-ROM Extensions (MSCDEX) as MS-DOS drives. The CD-ROMs can be read by MS-DOS commands, if appropriate, or by executing the relevant application programs (which are often on the CD-ROM itself).

SoftWindows automatically configures itself to recognize your CD-ROM drive, if any; no additional setup is required. By default, Windows95 assigns the CD-ROM drive to the D: drive. If you have a hard drive file (.hdf) assigned to D: drive in the Open Disk Drives dialog box, then Windows95 assigns the CD-ROM drive to the E: drive.

Note: Windows95 will override any VFSA drives you may have assigned to the E: drive (if the D: drive already has a hard drive assigned to it).

MS-DOS configuration

This section describes how to use a CD-ROM drive from Windows95 MS-DOS mode.

USECD executes the following command to assign the CD-ROM to drive F.

```
MSCDEX /D:CDROM$$$ /L:F
```

To use the USECD command:

- 1. Quit other media applications, such as CDman and cdplayer.
- 2. At the MS-DOS prompt, type

```
NET USE F: /D
```

to make the F: drive available for the CD-ROM.

3. Type USECD at the MS-DOS prompt.

Note: Windows95 automatically configures the CD; you only need to use this procedure in DOS mode.

MSCDEX options

The MSCDEX command can accept the following parameters:

 Table 4-2
 MSCDEX Command Parameters

Parameter	Function
/D: device	Specifies the device driver to be used. For SoftWindows this is CDROMSSS.
/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 provides emulation of the standard Super VGA display adapter.

It also emulates the Hercules display adapter type, which is the recommended option if you have a monochrome display.

To specify the display adapter

- Choose *Display*... from the *Options* menu.
 A dialog box shows the display adapter currently selected.
- 2. Select the *Display Adapter Type* you want to use by clicking the appropriate button.

To specify the number of colors for Windows

Windows95 automatically selects 256 colors. If you wish to change that,

• Select the number of colors in the Display dialog box.

To disable automatic resizing

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

Here is an explanation of the options:

- 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 after resizing its window.

To specify when to resize the Windows desktop

- Select *Never* if you do not want to be prompted to resize the Windows desktop.
- 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.
- Select *Always* if you want to be prompted to resize the Windows desktop.
- Click OK to reset SoftWindows with the display settings you have chosen.

Setting up keyboards

When you install SoftWindows, the installation procedure automatically sets up 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 MS-DOS programs, 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" to the AUTOEXECBAT 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 tables on the following pages.

The Unix keyboard mapping files are provided in \$SWINHOME/keyboard.

To use an international keyboard for Windows 95

- 1. Ensure that the Windows 95 upgrade is available to SoftWindows.
- 2. Click *Start*, then *Settings* and *Control Panel*.
- 3. Double-click the *Keyboard* icon in the *Control Panel* folder. The *Keyboard Properties* dialog box is displayed.
- 4. Click the *Language* tab to display its panel.
- 5. Click *Add...*, select the language you want to use from the drop-down list box, and click *OK*.
- 6. Click Set as Default to choose it as the default language.
- 7. Click OK.

Keyboard configuration

 Table 4-3
 Keyboard Configuration Table SGI

Keyboard type file	KEYB command	Keyboard mapping
SGI FR	KEYBFR,850,C:\DOS\KEYBOARDSYS	SG.kbd
SGI GR	KEYBGR850C:\DOS\KEYBOARDSYS	SG.kbd
SGI UK	KEYBUK,850,C:\DOS\KEYBOARDSYS	SG.kbd
SGI US	_	SG.kbd
SGI FR INDY	KEYBFR,850,C:\DOS\KEYBOARDSYS	SGINDYfr.kbd
SGI GR INDY	KEYBGR,850,C:\DOS\KEYBOARDSYS	SGINDYgr.kbd
SGI UK INDY	KEYBUK,850,C:\DOS\KEYBOARDSYS	SGINDYuk.kbd
SGI US INDY	_	SGINDYuskbd

MS-DOS configuration

The AUTOEXECBAT and CONFIGSYS files determine the configuration of MS-DOS in SoftWindows.

AUTOEXEC.BAT

The following listing shows the AUTOEXECBAT file:

```
@Echo Off
Prompt $p$g
C:\INSIGNIA\FSADrive
Path C:\WINDOWS;C:\WINDOWS\COMMAND;C:\Insignia;C:\
rem - By Windows Setup - C:\INSIGNIA\Mouse
REM Remove the following REM to enable DOS application licencing
REM C:\INSIGNIA\DOSLIC.EXE
C:\WINDOWS\COMMAND\Mode COM1:9600,n,8,1
Ver
```

CONFIG.SYS

The following listing shows the CONFIGSYS file:

DEVICE=C:\WINDOWS\SETVER.EXE

DEVICE=C:\WINDOWS\HIMEM.SYS /TESTMEM:OFF

DEVICE=C:\INSIGNIA\HOST.SYS

Additional installation information

This chapter explains how to upgrade your existing version of SoftWindows, and lists the files installed by the installation process.

Upgrading a SoftWindows 2.0 hard disk file to Windows 95

SoftWindows 95 includes utilities to automate the process of upgrading a SoftWindows 2.0 hard disk file from Windows 3.11 to Windows 95, so that it can be used as the C drive with SoftWindows 95. These are provided in the directory \$SWINHOME/win95.

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

- Run SoftWindows with drive C set up as the hard disk file you want to upgrade.
- Ensure that \$SWINHOME is set up as an FSA drive, such as drive H:
- Ensure that networking is disabled in the CONFIG.SYS and AUTOEXEC.BAT files.
- If you are asked to accept Microsoft's End User License Agreement, press *Alt-Y*.
- Run the upgrade program by moving to drive H:, and executes *upgr95.bat*.

Windows 95 setup analyzes the hard disk file, and then copy files to it, without further prompts.

Windows 95 starts, followed by a finalization phase and Insignia Solutions optimizations.

Windows 95 is then installed on the C hard disk file.

If necessary, networking can be re-enabled as described in Networking with SoftWindows.

Installation Options

If you want to install other Windows 95 optional components, edit the file: \$\$SWINHOME/win95/insignia.inf and change the value of the optional component you want to install to 1.

For example, to install System Monitor, change:

```
"System Monitor"=0
to
"System Monitor"=1
```

If you change the *insignia.inf* file, you may be prompted for additional information during installation.

Alternatively, you can install optional components from the Windows 95 setup directory using Windows 95 *Install/Remove Software* control panel.

Deinstalling SoftWindows

To remove SoftWindows

To remove SoftWindows from the workstation on which you installed it, follow these steps:

- 1. Choose Software Manager from the System toolchest.
- 2. Click the Managed Installed Software button.
- 3. In the *Remove* column, click the checkbox next to SoftWindows.
- 4. Click the *Start* button.

When the removal is complete, a dialog box appears and reports that the removal was successful.

For more information, see Chapter 4, "Installing and Removing Software," in the *Personal System Administration Guide*.

Software installed by the installation procedure

To list software installed with SoftWindows

For a full list of software installed by the SoftWindows installation, choose Software Manager from the System toolchest, and click the *Manage Installed Software* button. To view the SoftWindows subsystems, click the SoftWindows entry to expand it. To display all subsystems installed, choose Subsystems Only from the Software menu.

To find directories with software installed by SoftWindows

SoftWindows installs software in the /usr/lib/SoftWindows directory on your system. It also installs a file called WIN95-username.hdf in your home directory, unless you specify otherwise.

Default FSA drive configuration

The following FSA drives are configured by default:

• E: \$HOME and H: \$HOME—The user's Unix home directory. Files here can normally be modified by the user.

SoftWindows licensing

This chapter gives additional information about the FLEXIm licensing system and explains how to use the SoftWindows License Manager to modify a license. SoftWindows is supplied with FLEXIm version 4.1.

The FLEXIm licensing system

You can find additional licensing information by reading the *SoftWindows Usage Hints* Web page. Check this page for technical support information as well.

SoftWindows uses a licensing system called FLEXIm, 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 FLEXIm 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.

Note: If you are installing a demo license or a nodelock license, no license server is needed.

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, *install/FLEXIm*, where *install* is the SoftWindows installation directory.

A typical licensedat file looks like the following example:

```
SERVER waltz 35648797 744

DAEMON insignia /usr/SoftWindows95/FLEXlm

FEATURE Insignia_SoftWindows insignia 2.000 1-Jan-01 1

BBE82091CF80F95936F2 "4100 0000 1000 0001"
```

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.

The SERVER and DAEMON lines are added to the licensedat file by the License Manager dialog box and may be modified later by the user.

The *license.dat* file is generated by the License Manager dialog box. If you attempt to run SoftWindows without a license, a warning dialog pops up which states:

1085: SoftWindows was unable to obtain a license. Select continue to install one.

Clicking Continue will bring up the license dialog.

You can also bring up the License Manager dialog box by choosing *Licensing* from the *Actions* menu while logged in as *root*.

The TCP port number

FLEXIm 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 FLEXIm. This number can be changed but 744 is the default. The name of the server in this example is "waltz."

The TCP number is important, because if the system in the above example is a license server, FLEXIm uses this number to locate the server for users on other systems. To do this, each user must set their 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 FLEXIm directory, which is NFS mounted under /servers/licserv, then LM_LICENSE_FILE could be set to /servers/licserv/FLEXIm/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 FLEXIm

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

There are two ways to start FLEXIm using the *Imgrd* utility, in addition to using the user interface.

The examples in this section assume that the \$SWINHOME environment variable has been set to the default installation location of SoftWindows.

To start FLEXIm manually

The disadvantage of starting FLEXIm manually is that FLEXIm will need to be restarted if the machine is rebooted. SoftWindows is configured to start FLEXIm automatically, so in general you do not need to start it manually.

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. Include all \$, > , & characters.

To start FLEXIm 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 (type on a single line):

```
is1:234:respawn:install/FLEXlm/lmgrd -c /install/FLEXlm/license.dat
install/FLEXlm/lmgrd.log 2>&1
```

where *install* is the SoftWindows installation directory; for example, /usr/lib/SoftWindows.

After adding the above line to the relevant system file, type the following command to start FLEXIm:

```
/etc/init q
```

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

To shut down FLEXIm

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

If FLEXIm were 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 FLEXIm, delete the line that was added to the /etc/inittab file, and enter the following command at the Unix prompt:

```
/etc/init q
```

This causes the system to reread the *letclinittab* 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 a Unix prompt by entering a line similar to the following, replacing the TCP port numbers

and the names of the servers ("waltz" and "tango") with the appropriate information for your servers:

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 export LM_LICENSE_FILE

Modifying SoftWindows licenses

SoftWindows includes a Licensing function that allows you to view the licensing information for your SoftWindows installation, install a new license, or make changes to an existing license setting.

To display the License Manager

- 1. Log in as root.
- 2. Run SoftWindows.
- 3. Choose *Licensing* from the *Actions* menu.

A dialog box displays the licensing information for your SoftWindows installation.

To install a new license

- 1. Choose the type of license by selecting Nodelocked or Concurrent as appropriate. (For more information on license types, see Table 3-1.)
- 2. Enter the Serial Number, Expiry Date, Authorization Code, and the Number Of Users in the appropriate text boxes.
- 3. Click *Install License* to install the new license.

Note: If Nodelocked 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.

To specify a different license issuer

By default, Silicon Graphics is specified as the issuer of your SoftWindows license. You can change this default by setting an environment variable before you run SoftWindows; after setting the variable, you can install your license. Follow these steps:

- 1. Open a Unix shell window.
- 2. For a C shell user, enter this line at the command prompt:

```
setenv SWINLIC_ISSUER "name of company"
```

Replace name of company with the name of company that issued the license.

3. Start SoftWindows by entering

swin

at the command prompt; make sure you enter this command in the same Unix shell window where you entered the command shown in Step 2.

4. Install your SoftWindows license by following the instructions in the sections "To display the License Manager" and "To install a new license."

To run SoftWindows on a network that is currently using FLEXIm

1. Copy the relevant details from the file \$SWINHOME/FLEXIm/license.dat into your own license.dat file, and remove the original file. Insignia 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.

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
```

or

- % setenv LM LICENSE FILE /net/machine/install/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
```

or

- \$ LM_LICENSE_FILE=/net/machine/install/FLEXlm/license.dat; export LM_LICENSE_FILE
- In these examples *install* 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 SoftWindows.
- 3. Choose *Licensing* from the SoftWindows *Actions* menu to display the license manager dialog box.
- 4. Choose *Advanced* to display the TCP Port section of the dialog box.
- 5. Enter a new TCP port number.

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

Licensing SoftWindows with other products using FLEXIm

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

This section discusses how to avoid this problem.

Products using the same license servers

In this case, there are two solutions:

- 1. 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.
- 2. 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 FLEXIm, always use the latest versions of the *Imgrd* and the *Imutil* utilities. If any products use a version of FLEXIm before v2.0, then the -b startup argument must be used for Imgrd.

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).

FLEXIm 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 FLEXIm-based product, use the following command as root:

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

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

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

If you have vendor daemons with different FLEXIm 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 FLEXIm. 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

O

% commandname

All the utilities take the following arguments:

- -v—Print version and exit
- -c license_file—Operate on license_file

Note: The *Imdown*, *Imremove*, and *Imreread* commands are limited to privileged users. If you have started Imgrd 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 Imadmin group or a member of group 0, if the *Imadmin* group does not exist.

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

Imcksum

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.

Imdown

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. For details of how to shut down FLEXIm refer to Chapter 6, "To shut down FLEXIm".

Imhostid

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

To obtain the host ID you should enter:

lmhostid

Imremove

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 *Imremove* 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 *Imremove*, since removing a user's license can be disruptive.

Imreread

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 re-read the license file for changes in feature-licensing information.

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

Imstat

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:

- -a—Display all licensing information.
- -A—List all active licenses.
- *-c license_file*—Use license_file.
- -S [daemon]—Restrict output to one daemon, and the features and users of that daemon.
- **-f** [*feature_name*]—List users of named feature or all features if no feature name is given.
- -i [feature_name]—Prints information about the named feature or all features if no feature name is given.
- -1 [regular expression]—List users of matching license(s).
- -s [server_name]—Display status of named server node or of all servers if no server name is given.
- -t value—Set Imstat timeout to value.

Note: The command *Imremove* uses the output from *Imstat -a.*

Imswitchr

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

Imver

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

```
lmver [filename]
```

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

Hostids for FLEXIm-supported machines

FLEXIm 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 802005ac, you would specify 080020005AC as the hostid.

The program *lmhostid* will print the exact hostid that FLEXlm expects to use on any host. To obtain the host id for your system enter the following from a UNIX shell:

```
% echo '/etc/sysinfo -s' 16op | dc
```

Configuring SoftWindows

This chapter describes the SoftWindows system configuration and user configuration files, and the X-resource configuration options.

SoftWindows configuration file

Each user's configuration settings are stored in a file named <code>.swinconfig</code> in the user's home directory. This file determines the settings that appear in the <code>Options</code> menu dialog boxes. If you change any of the settings, and the <code>Save Configuration Changes</code> option is checked in the Exit dialog box, the new values will be saved in the user's configuration file on exiting <code>SoftWindows</code>. You can also use the <code>Save Configuration</code> option in the Actions menu, if you wish to save the configuration changes without quitting.

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 directory /usr/lib/SoftWindows, specified by the environment variable \$SWINHOME.

Editing the system configuration file

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

To do this, *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 shown below.

The following entries determine the user's initial SoftWindows preferences:

```
DRIVE C FILE NAME
DRIVE_D_FILE_NAME
DRIVE_CDROM_DEVICE_NAME
DRIVE_D_FSA_DIRECTORY
DRIVE_E_FSA_DIRECTORY
                                   $HOME
DRIVE_F_FSA_DIRECTORY
                                   /CDROM
DRIVE_G_FSA_DIRECTORY
DRIVE_H_FSA_DIRECTORY
                                   $HOME
DRIVE_I_FSA_DIRECTORY
DRIVE_J_FSA_DIRECTORY
DRIVE_K_FSA_DIRECTORY
                                   /floppy
DRIVE_L FSA DIRECTORY
DRIVE_M_FSA_DIRECTORY
DRIVE_N_FSA_DIRECTORY
DRIVE_O_FSA_DIRECTORY
DRIVE_P_FSA_DIRECTORY
DRIVE_Q_FSA_DIRECTORY
DRIVE_R_FSA_DIRECTORY
DRIVE_S_FSA_DIRECTORY
DRIVE_T_FSA_DIRECTORY
DRIVE_U_FSA_DIRECTORY
DRIVE_V_FSA_DIRECTORY
DRIVE_W_FSA_DIRECTORY
DRIVE_X_FSA_DIRECTORY
DRIVE_Y_FSA_DIRECTORY
DRIVE_Z_FSA_DIRECTORY
DRIVE_FLOPPY_A_DEVICE_NAME
DRIVE_FLOPPY_B_DEVICE_NAME
DISPLAY_GRAPHICS_ADAPTOR
                                   VGA
DISPLAY_SIZE
                                   1.0
                                   640
DISPLAY_MSWIN_WIDTH
                                   480
DISPLAY_MSWIN_HEIGHT
DISPLAY_MSWIN_COLOURS
                                   256
```

```
MEMORY_EXTENDED_SIZE
                                8
LPT_PORT_1_PS_FLUSH
                                Yes
LPT_PORT_2_PS_FLUSH
                                No
LPT_PORT_3_PS_FLUSH
                                No
LPT_PORT_1_TYPE
                                Pipe
LPT_PORT_2_TYPE
LPT_PORT_3_TYPE
LPT_PORT_1
                                lp
LPT_PORT_2
LPT_PORT_3
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_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_FLOW
                                No
COM_PORT_2_FLOW
                                No
COM_PORT_3_FLOW
                                No
COM_PORT_4_FLOW
                                No
SECURE
                                No
SECURE_MASK
                                0
SOUND
                                Yes
AUTO FREEZE
                                No
AUTO_FLUSH
                                Yes
                                50
AUTO_FLUSH_DELAY
KEYBOARD_MAP_FILE_NAME
                                $SWINHOME/keyboard/SGINDYus.kbd
FILE_DEFAULT
                                $HOME/SoftWin.tmp
DEVICE_DEFAULT
PIPE DEFAULT
                                lp
DRIVE_HARD_DISK_MAX_SIZE
                                300
                                32
MEMORY_EXTENDED_MAX_SIZE
                                Yes
FPU_EMULATION
MSWIN_RESIZE
                                Never
SOUND_DEVICE_NAME
                                SGI
                                00 00 00 00 00 00 00 00 00 00 26 02
00 80 00 00 20 00 f0 00 01 80 02 00 00 14 00 00 00 00 00 00 00 00 00
00 00 00 00 00 00
```

Lower
Lower
90
Smart
\$HOME/.swinturbo

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

MSWIN_RESIZE

- 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

- File—Output to a Unix file.
- **Pipe**—Pipe to a Unix process (for example, a print spooler).

- **Device**—Output to a Unix printer port.
- Blank—Port disabled.

COM_PORT_x_TYPE

- 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

- VGA or SVGA—SVGA display.
- Hercules—Hercules display.

DRIVE_x_FSA_OPTION

- Lower—Files are saved to FSA drives in lower case.
- **Upper**—Files are saved to FSA drives in upper case.
- Insensitive—Files are saved as they are typed in on the FSA drive.

WINDOW_RESIZE_MODE

- 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 window prompts the user to restart SoftWindows, for use with Windows 3.11 ONLY.

Note: SoftWindows does not ship with Windows 3.11; Windows 3.11 exists only on 2.0 disks that have not been upgraded to Windows 95.

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:

- 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, *sOftWindows*, located in \$SWINHOME.

When editing the SoftWindows X resource file note that the X resource name *sOftWindows* 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 *sOftWindows* file:

```
sOftWindows*dispPBG.sensitive:true
```

And change it to:

```
sOftWindows*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 sOftWindows file:

```
sOftWindows*optionCBW.sensitive:true
```

And change it to:

```
sOftWindows*optionCBW.sensitive:false
```

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

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

To the following:

```
sOftWindows*fileCBW.sensitive:false
```

```
sOftWindows*optionCBW.sensitive:false sOftWindows*actionCBW.sensitive:false
```

Menu font sizes

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

```
sOftWindows*FontList:screen14
```

Windows driver display sizes

When the user launches Microsoft Windows, the Resize dialog box appears, allowing 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, sOftWindows, and are defined using the following lines:

```
sOftWindows*windowSizeWidth1:640
sOftWindows*windowSizeHeight1:480
sOftWindows*windowSizeWidth2:800
sOftWindows*windowSizeHeight2:600
sOftWindows*windowSizeWidth3:680
sOftWindows*windowSizeHeight3:700
sOftWindows*windowSizeWidth4:880
sOftWindows*windowSizeHeight4:700
```

To change the default size settings, simply modify the relevant lines. For example, to make the fourth pair of default sizes equal to 1024×768 , change the lines to:

```
sOftWindows*windowSizeWidth4:1024
sOftWindows*windowSizeHeight4:768
```

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, Microsoft Windows, and Windows and MS-DOS applications in various configurations, refer to the following sections of the SoftWindows documentation.

SoftWindows - see Chapter 3, "Installing SoftWindows".

Microsoft Windows applications – see "Using Windows" in the *SoftWindows95 for Unix User's Guide*.

MS-DOS applications – see "Using MS-DOS" in the SoftWindows95 for Unix User's Guide.

Installation Option 1

- 1. Install SoftWindows on the local workstation.
- Run SoftWindows on the local workstation.
- 3. Install applications 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, and MS-DOS 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

- 1. Install SoftWindows on the local workstation.
- Install applications on an NFS server.
- 3. 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.

- Requires more than 75 Mbytes of hard disk space on each local workstation.
- The SoftWindows software updates have to be applied to each local workstation.

Installation Option 3

- 1. Install SoftWindows on the local workstation.
- 2. Install applications on a PC LAN file server.
- 3. 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.

- Typically slower than Option 1 or Option 2.
- Requires more than 75 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

- 1. Install SoftWindows on an NFS server.
- 2. Install applications on an NFS server.
- 3. Run SoftWindows on the local workstation via NFS.
- 4. Create SoftWindows C: drive for each user on the NFS server.

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.

- Accessing SoftWindows and application files from an NFS server is generally slower than accessing them from a local hard disk.
- There is read-only access to SoftWindows hard disk files for all users except the first.
- This can be avoided by creating separate hard disk files for each user on the server or local workstation.
- Possible problems with NFS and SUID bit permissions.

Installation Option 5

- 1. SoftWindows files are split between the local workstation and an NFS server.
- 2. Install applications on an NFS server.
- 3. 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 some key SoftWindows files installed on the local workstation.

The size of the SoftWindows footprint on the local workstation's hard disk can range from 5 Mbytes to 20 Mbytes, depending upon how SoftWindows is split.

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.
- After the first user launches SoftWindows other users have read-only access to the SoftWindows hard disk files.

This can be avoided by creating separate hard disk files for each user on the server or local workstation.

- Possible problems with NFS and SUID bit permissions.
- All of the local workstation's SoftWindows files must be updated when software updates are applied to SoftWindows on the NFS server.

Installation Option 6

- 1. Install SoftWindows on a remote Unix workstation.
- 2. Install applications on a remote Unix workstation.
- 3. 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.

- 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 (via SoftNode) 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 SoftNode limitation would be to store any data or applications files on an NFS server or on the remote workstation, and then use FSA 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.
- After the first user launches SoftWindows other users have read-only access to the SoftWindows hard disk files.

This can be avoided by creating separate hard disk files for each user on the server or local workstation.

Memory considerations

Physical memory

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

The recommended SoftWindows session size is 8Mbytes. The Unix process size will be approximately 25 Mbytes, leaving the Unix kernel and X server with 7 Mbytes of real memory. This is unlikely to be sufficient, and swapping will result leading to a degradation in performance of both SoftWindows and other processes running on that machine.

PC memory

To run Windows applications under SoftWindows the recommended amount of PC memory is 8 Mbytes, as on a real PC. This varies from one application to another, however; it is recommended that you read the application's documentation for details.

Certain resource-intensive applications, such as Microsoft Word 6 and Excel 5, require 8 Mbytes of PC 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.

CPU memory

SoftWindows uses host memory to support the 486 emulation in addition to the memory used to emulate PC memory. It is possible that adjusting the amount of host memory dedicated to the 486 emulation can improve performance. By default, the 486 emulation is allocated the maximum value of 8 Mbytes, or 1024 code buffers. You can change this by setting the environment variable Soft486Buffers.

LIM

LIM is supported within SoftWindows via a LIM emulator which makes use of PC memory. For performance reasons, we recommend that you do not configure SoftWindows to use LIM unless your application requires it to run because using LIM entails a performance overhead. Refer to "Setting up memory" in Chapter 4 for information on how to configure LIM if required.

Windows versus Unix swapping

The 80486 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 or allocating enough 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*" 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 80486 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.

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 (SoftNode) component of SoftWindows since, for particular protocols on particular platforms, SoftNode 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 24-bit graphics card.

There may 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. It should be noted that the results were very host-specific.

SoftWindows screen size

Whether you are using SoftWindows in MS-DOS only or within Windows, 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 Windows 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

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%. If you have moved SmartDrive to the Startup program group, it is recommended that you disable it in SoftWindows by moving the SmartDrive icon out of the Startup program group.

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.

WinIdle

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

Note: WinIdle only runs in Windows95 mode.

Advanced installation options

This chapter describes some of the advanced installation options available with SoftWindows. Before attempting any of the procedures described here, it is a good idea for you to back up your *sys.swinconfig* file first.

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:

- 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 *install*
- % mount sourcemachine:install install

where *sourcemachine* is the name of the workstation where SoftWindows was physically installed, and *install* 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 /net/sourcemachine/install install

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

2. Run SoftWindows.

Installing SoftWindows on a second workstation

To install SoftWindows on a second workstation, install SoftWindows as normal, but remove the \$SWINHOME/FLEXIm/licensedat 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 /net/machine/install/Flexlm/license.dat

Or:

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

For example, enter the following command:

% ln -s /hosts/machine/install/FLEXlm/license.dat

where *install* is the SoftWindows installation directory.

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 MS-DOS and Windows programs.
- The MS-DOS boot modifier keys, *F5*, *F8*, and *Shift* are disabled so that users cannot modify the boot sequence.
- The MS-DOS control key combinations, *Ctrl-C*, *Ctrl-Break*, and *Ctrl-Alt-Del* are disabled so that users cannot force an exit from application programs.
- SoftWindows can be set up so that SoftWindows terminates when the user exits from an application.

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

To run SoftWindows in secure mode

- 1. Log in as the user, and start SoftWindows to set up a hard disk file and any required FSA drives to run the required PC application.
- 2. Add the following command to the user's AUTOEXECBAT 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 *install/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 *sysswinconfig*, ensure that it is owned by root and has the SUID bit set. If necessary, log in as root and **d** 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*, "Configuring SoftWindows".

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 FSA 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 \$SWINHOME/sys.swinconfig should not use environment variables (such as \$HOME) to locate hard disk files, FSA directories, and so on. Otherwise the user could set the environment variable to use an alternate directory.

Networking with SoftWindows

This chapter describes the networking features built into SoftWindows.

Introduction

SoftWindows includes Insignia's SoftNode network driver to enable you to share files or run multiuser applications on a network.

By default SoftWindows SoftWindows is setup to work with Winsock applications like Netscape and Microsoft Explorer to easily access your PC network and the world wide web.

SoftWindows by default is not installed with the software necessary to connect to a Novell Netware server, a Microsoft LanMan server, or other similar packages. To use these packages, you must first install the appropriate networking software for the network you are using. SoftWindows comes complete with Novell NetWare and Microsoft LAN Manager client software, which you can use to connect to file servers from a Unix workstation on Ethernet networks. Install the lman22 subsytem from your Application Installation CDas a first step to enabling these features.

SoftWindows is also compatible with most other network software which you should install just as you would on a PC.

Note: Before attempting to install any client software, or set up any network parameters that you would want for Windows 95, you must set up for VFSA in the install directory (\$SWINHOME/win95). For more information on VFSA, see "Setting up VFSA drives through Windows95" in Chapter 4.

After choosing the client software and setting up network parameters that you want in Win95, you are prompted for the setup directory in Windows95 (\$SWINHOME/win95) to install the driver for the network that you have chosen.

What is SoftNode?

The networking drivers within SoftWindows are referred to as SoftNode. SoftNode is a collection of Open Data-link Interface (ODI) and Winsock drivers which allow SoftWindows to act as clients on various networks. Whatever network client is to be used, it should be installed just as on a real PC, following the manufacturer's instructions.

SoftWindows acts as an independent node on the network, and you may need to inform your Network Administrator of its presence. Please note that SoftNode uses the host's network interface and this can restrict the use of multiple copies of SoftWindows running on the same machine.

If you have problems connecting SoftWindows to a network server, it is recommended that you try a real PC from the same network position to verify that the problem is not network-based. For configuration problems, check the troubleshooting hints within this section

The SoftWindows networking drivers are stored in the C:\INSIGNIA directory, under the following names:

- ODI Ethernet—ETHERSPC.COM
- Winsock 16 bit—WINSOCK.DLL
- Winsock 32 bit—WSOCK32.DLL

Enabling network support within SoftWindows

Winsock

SoftWindows is supplied with Winsock 1.1 compliant drivers. Unlike third-party Winsock drivers, which require a 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.

SoftWindows will run Winsock-based applications without any modification. The 16-bit (WINSOCK.DLL) and the 32-bit (WSOCK32.DLL) Insignia Winsock drivers are

pre-installed within the Windows 95 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's TCP/IP protocol stack, they both share the same IP address.

If you are installing a third-party TCP/IP protocol stack which comes with its own Winsock drivers, either those drivers or SoftWindows' may be used. Follow the manufacturer's instructions on how to install their Winsock-compliant interface.

Insigina's Winsock drivers can be used by any Winsock-compliant applications. A list of known Insignia Winsock-compatible applications is given below:

- Lotus Notes for Windows v3.0c (16-bit)
- WS-FTP16
- WS-FTP32
- NCSA Mosaic (16-bit)
- NCSA Mosaic (32-bit)
- Netscape (16-bit)
- Netscape (32-bit)

PC network clients

To configure networking clients within the Windows environment, first configure and load the SoftWindows ODI driver.

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

```
CD C:\NWCLIENT
LSL.COM
ETHERSPC.COM
CD \
```

- 2. Edit the ODI system file C:\NWCLIENT\NET.CFG to support the required clients. It is pre-configured to support NetWare and Microsoft clients. Refer to the NET.CFG file for more information.
- 3. Save these new files.
- 4. Restart SoftWindows, ensuring that the ODI driver, ETHERSPC.COM, has been loaded successfully by pressing *Esc* during start-up.

- 5. Once SoftWindows has started, click the *Start* button, point to *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 has previously been configured, the Network dialog box Configuration page should show 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.
- 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

If this option is not present, ensure that SoftWindows was able to initialize the network adapter at start-up.

The Network dialog box should now list the driver you selected, and associated clients and protocols.

- 11. Remove those clients and protocols you do not need.
- 12. Add those you wish to be loaded.
- 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.

Supported frame types

The following lists the frame types supported by SoftWindows under IRIX 6.2:

- ETHERNET_802.2
- ETHERNET_II
- ETHERNET SNAP
- ETHERNET_802.3

Introduction to ODI

ODI stands for Open Data-link Interface, a networking standard for PC network interface cards which ensures compatibility between different networking products.

The Open Data-link Interface is implemented by an ODI driver, which receives a simple set of commands, such as register protocol or transmit packet, and converts them into commands for a particular network interface. In general, each network interface has its own ODI driver. The ODI driver therefore acts as the interface between the Novell NetWare client software or any other ODI-compliant application and a specific network interface card.

The SoftWindows ODI driver is referred to as SoftNode because it is an interface to software rather than to a specific network interface.

Configuring the ODI

The ODI system is configured through a single file, NEICFG.

The 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 NETCFG 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 NETCFG file is used to configure the Open Data-link Interface's Link Support Layer (LSLCOM). 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 NETCFG 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.

MAX PACKET SIZE

Syntax:

MAX PACKET SIZE 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 MAX PACKET SIZE for Ethernet is 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 PROIOCOL mismatches occurring, and also makes configuring both ODI and NDIS 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 raw packets.

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

Starting the ODI system

The ODI system is started using the following sequence of steps:

1. Start the Link Support Layer with the command:

LSL

2. Start the Insignia ODI driver for the Ethernet network by typing the following command:

ETHERSPC

Stopping the ODI system

The ODI system is halted by unloading the ODI drivers in the reverse order. For example, on Ethernet type:

ETHERSPC U LSL U

Troubleshooting ODI

Link Support Layer

There should not be any problems 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 NEICFG file.

The ODI driver

If you have problems loading the ODI driver, refer to the troubleshooting section for the particular networking software you are using.

Installing network products

To use a network product with SoftWindows:

- 1. Install the network software.
- Configure the ODI driver for the package you are using.
- 3. Start the network package.

This section gives general information about each of these stages. Common network packages which can be used with SoftWindows are also discussed.

To install the network software

Install the network product, just as you would on a PC, following the manufacturer's instructions. If the installation process requires details of the network driver with which it is to be used, either select the required SoftWindows ODI driver, or the one which best matches the SoftWindows ODI driver.

This chapter includes several network application installation examples.

SoftWindows networking limitations

There are a few limitations which must be considered when using networking clients within SoftWindows. These are listed below:

- When using TCP/IP-based clients within SoftWindows it is advisable to run SoftWindows on Unix 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.
- SoftNode will only use the first (built-in) network interface.
- When running multiple SoftWindows sessions on the same machine, only *one* SoftWindows session will support networking via SoftNode.
- Do not select Auto Freeze within SoftWindows if you are using SoftNode. 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.
- 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 SoftNode will receive and must then filter.

Troubleshooting

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

Command-line option

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

Environment variable

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

- X—SoftNode errors are displayed in an error dialog box.
- **console**—SoftNode errors are output to the system console.

IRQ level

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

Ethernet frame types

ETHERNET_802.2 packet format

An 8022 packet is easily identified by its header. All 8022 packets have a 2-byte field following the hardware addresses which is the size of the complete packet. 8022 packets have a maximum size of 1514 bytes (decimal).



Figure 10-1 Ethernet 802.2 Packet Format

ETHERNET_II packet format

The ETHERNET_II packet has a 2-byte field following the hardware addresses which is the packet type field. Each protocol has a unique packet type with a value above 0x5EA (1514).

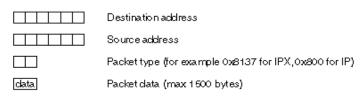


Figure 10-2 Ethernet II Packet Format

ETHERNET_SNAP

The SNAP packet has a 5-byte field following the 8022 header.

	Destination address
	Source address
	Packet size (max 1514 bytes)
	Destination Service Access Point (DSAP) (always 0xAA)
	Source Service Access Point (SSAP) (always 0xAA)
	Control byte (always 0x03)
	Protocol type (for example 0:0:0:81:37 for IPX)
data	Packet data (max 1492 bytes)

Figure 10-3 Ethernet SNAP Packet Format

ETHERNET_802.3 packet format

ETHERNET_8023 was developed by Novell and is not recognized as an official IEEE packet format. 802.3 packets are 802.2 packets without the DSAP, SSAP, and control fields. However, the first 2 bytes of a Novell IPX packet using 802.3 are 0xFF and 0xFF. This packet format has been phased out by Novell.



Figure 10-4 Ethernet 802.3 Packet Format

PC networking protocols

The table below provides information on the frame types and protocol IDs required in the NEICFG file for common Network Operating Systems (NOS) and SoftWindows.

Table 10-1 Frame Types and Protocol IDs

Network operating system	Name	ID	Frame type
Novell NetWare (IPX)	IPX	8137	ETHERNET_II
	IPX	E0	ETHERNET_802.2
	IPX	8137	ETHERNET_SNAP
	IPX	0	ETHERNET_802.3
Windows 95	SMB	F0	ETHERNET_802.2
Microsoft LAN Manager (NETBEUI)	SMB	F0	ETHERNET_802.2
Microsoft LAN Manager (TCP/IP)	${ m I\!P}$	800	ETHERNET_II
	ARP	806	ETHERNET_II
Banyan VINES (Vines IP)	VINES	BAD	ETHERNET_II
General TCP/IP connectivity	${ m I\!P}$	800	ETHERNET_II
	ARP	806	ETHERNET_II

NEICFG entries have the following structure:

FRAME frame_type
PROTOCOL name ID frame_type

Where two or more protocols of the same frame type are provided for the NOS, *all* must be present in the NETCFG file for the client to work correctly. For example, for the Microsoft LAN Manager client to work over TCP/IP, the following *must* be defined in the Ethernet section of the NETCFG file:

FRAME ETHERNET_II

PROTOCOL IP 800 ETHERNET_II

PROTOCOL ARP 806 ETHERNET_II

SoftWindows network devices

SoftWindows uses a low-level host network driver to provide access to the network. For IRIX 6.2, the device used by SoftWindows is *sockets*, the device name is *snoop*.

Note: Manufacturers of the host platforms supported by SoftWindows regularly update their networking devices. It is therefore suggested that when installing SoftWindows, you check with the relevant manufacturer for any appropriate low-level networking device patches which may be required.

Note: Users should ensure that the devices required by networking exist on the system before running SoftWindows. If the devices are not present, when you run ETHERSPC from DOS an error will be displayed indicating that the corresponding card could not be found.

Licensing MS-DOS and Windows applications

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

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

These procedures are described in the following sections.

Setting up application licensing

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

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 WININI file:

LOAD=C:\INSIGNIA\WINLIC.EXE

The default WININI file supplied with SoftWindows includes this line near the beginning of the file, commented out. To enable it, remove the ";" at the start of the line.

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

To enable MS-DOS application licensing

Add the following line to each user's AUTOEXECBAT file:

C:\INSIGNIA\DOSLIC.EXE

The default AUTOEXECBAT file supplied with SoftWindows includes this line, commented out. To enable it, just remove the REM statement at the beginning of the line.

Generating application licenses

SoftWindows includes a GENLIC utility to generate the licenses for MS-DOS and Windows applications.

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

\$SWINHOME/dos/insignia

To run the license generator

Configure a suitable FSA 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 FSA drive or copy it to a suitable directory.

To generate a license

1. 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

The GENLIC screen is displayed.

This prompts you for the following information:

Table 11-1GENLIC Prompts

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/FLEX1m/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 1.000 1-jan-04 4 5DC04041C6EE3F7CCC43 "EDIT.COM"

The fields in this line are described in the following table

Table 11-2 GENLIC License Line

Field	Description	
FEATURE	Identifies the type of line to the license server.	
VaTG2Ua	An encrypted feature name, generated from the MS-DOS or Windows program being licensed.	
insignia	Specifies that the Insignia daemon controls the license.	
1.000	The version number of the feature. This will always be 1.000 for MS-DOS and Windows application licenses.	
1-jan-0	The expiry date, if specified.	
4	The number of users.	
5DC0	The FLEXIm 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 MS-DOS and Windows 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:

/usr/lib/SoftWindows/license.dat

1. Add the feature line displayed by GENLIC for each MS-DOS or Windows 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 MS-DOS or Windows application.

- 2. After making changes to the license file, type the following command at the Unix prompt:
- % install/FLEXlm/lmreread -c install/FLEXlm/license.dat

where *install* 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 *Imreread* has been executed.

To change the license for an application

To change the license for an application proceed as follows:

- 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 FLEXIm daemon log file.

Sample license file

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

```
SERVER ivy 4606bc4e 744

DAEMON insignia /usr/lib/SoftWindows95/FLEXlm

FEATURE Insignia SoftWindows95 insignia 1.000 01-jan-00 20
145BF061754DC412304A "5003 6583 7650 0020"

FEATURE VaTG62Ua insignia 1.000 1-jan-0 4 5DC04041C6EE3F7CCC43

"EXCEL.EXE"

FEATURE 9VHNPQ83 insignia 1.000 30-jun-1996 0 D9E6A0F149743A74F357

"WP.EXE"
```

Reference

This chapter gives reference information about the SoftWindows environment variables and command-line options, and the Insignia 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

 $\ML/\L/\L/\L/\L$ 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 12-1SNERROR Table

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.

SWINHOME

The directory containing the SoftWindows package.

Default

/usr/lib/SoftWindows

WINDOWS_DPI

Specifies the DPI (Dots Per Inch) value for the SoftWindows Windows Driver. 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 $\MNHOME/\L/\N$ and \MNHOME/\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.

-bs

Disables the backing store facility within the X server.

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

-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 (upper case)

Executes a specific 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 an FSA drive and executes the DOS command from that drive.

Example

```
% swin -C /usr/people/john/testprog.exe
```

SoftWindows will set up the K: drive to be /usr/people/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 swinconfigin /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.

-keymap

Specifies the keyboard type when running in serial terminal mode using the *-term* option.

Example

```
% swin -term vt100 -keymap vt220
```

This specifies that SoftWindows should use the VI220 keymap file, while running in VI100 mode.

```
swin -term
```

This will result in SoftWindows running in serial terminal mode using the default terminal type and keymap file.

-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 *xdpyinfo*, or a similar utility.

MS-DOS utilities

CDROM.SYS

The device driver which interfaces a PC CD-ROM program such as Microsoft MSCDEX to a CD-ROM device connected to your Unix workstation. CDROMSYS is included in CONFIGSYS, and must be loaded before running MSCDEX. The Unix device name is configured in the SoftWindows Open Disk Drives dialog box.

Note: This utility is only used when you are using the CD-ROM in MS-DOS.

Example

In C:\CONFIGSYS include the line:

DEVICE=C:\INSIGNIA\CDROM.SYS

DEVLOD.COM

Allows users to load MS-DOS device drivers which are normally loaded in from the CONFIGSYS 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 Insignia's FSA 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 HOSTSYS to enable Insignia's FSA system with the following command:

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

To automatically enable Insignia's FSA system, add the command to the AUTOEXECBAT 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 AUTOEXECBAT file.

Example

In AUTOEXECBAT, include the line:

C:\INSIGNIA\DOSLIC.EXE

Note: DOSLICEXE does not need to be loaded, if only the Windows application is to be licensed.

See also "WINLICEXE."

DOS2UNIX.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.

UNIX2DOSEXE 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 EDITCOM 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 NAMESTXT to Unix format, replacing NAMESTXT with the new file:

DOS2UNIX NAMES.TXT

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

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

In DOS, 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 AUTOEXECBAT.

If the utility is entered on its own, all assigned FSA drives are started. If FSADRIVECOM is followed by one or more drive letters, the assigned FSA drives will be started. Also the

named drives will be reserved and can be assigned from within the SoftWindows interface.

Note: HOSTSYS must be loaded before FSADRIVECOM is executed.

Example

In C:\AUTOEXEC.BAT, include the line:

C:\INSIGNIA\FSADRIVE.COM

See also HOSTSYS and NET.COM.

HOST.SYS

A redirector which provides access to the Unix file system using the SoftWindows FSA drives. It is normally loaded by CONFIGSYS.

Example

In C:\CONFIGSYS, include the line:

DEVICE=C:\INSIGNIA\HOST.SYS

See also "FSADRIVECOM"

MAKEBOOT.COM

Writes to the partition table of a SoftWindows hard disk file to make an MS-DOS partition bootable.

This is not normally required when using SoftWindows since any newly created hard disk file has a single MS-DOS partition which is marked as bootable in the partition table. However, if the MS-DOS FDISK command is used to modify the partition table of a SoftWindows hard disk file on the D drive, and the disk is formatted, (using the /Soption with the FORMAT command to transfer system files), it may not be possible to boot from the disk if it is configured as the C drive.

To make the disk bootable, configure SoftWindows to use the hard disk file as the D:drive and run MAKEBOOT. It requires one parameter which should be a number in the range 1 to 4, indicating the partition to be made bootable.

Example

MAKEBOOT 1

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 AUTOEXECBAT. 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 at the same time the Alt and Ctrl keys and the middle mouse button.

Note: It is not necessary to load MOUSECOM to be able to use the mouse in Windows, since SoftWindows loads a separate mouse driver when Windows is started.

Example

In AUTOEXECBAT, include the line:

C:\INSIGNIA\MOUSE.COM

See also the section "Using the mouse in MS-DOS" in the SoftWindows95 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
```

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 /Dargument. For example:

```
NET SUBST E: /D
```

will delete any substitution applied to drive E.

Note: NET JOIN and NET SUBST only work with FSA drives; they do not work with hard disk drives.

NET USE

Assigns and removes FSA drives.

NET USE supports the following options:

RUNUX.COM

Executes a Unix command from MS-DOS.

To use RUNUXCOM the required Unix command must be accessible on it to an FSA drive. The argument to RUNUXCOM 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.

RUNUX.COM returns the status of the Unix command in the DOS variable ERRORLEVEL.

Use the /Q switch if you don't want to display status in a terminal window.

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).

Example

With E configured to access the Unix directory \$HOME:

RUNUX 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 F5, F8, and Shift. SECURITY.COM should be run from AUTOEXECBAT when SoftWindows is in Secure Mode.

SECURITYCOM has no effect when SoftWindows is not in Secure Mode.

Example

Include the following line in AUTOEXECBAT:

C:\INSIGNIA\SECURITY.COM

See also "Running SoftWindows in secure mode" in Chapter 9.

SGINDYUS.KBD

Keyboard definition files, required to provide a correct mapping of certain keyboards when used with SoftWindows.

If required, they are provided as an argument to the KEYB command in AUTOEXECBAT.

The appropriate command is automatically included in AUTOEXECBAT, if required, depending on the type of keyboard selected when SoftWindows is installed. It will be necessary to add, change, or remove the command if the keyboard type is subsequently changed or you need to use a display which has a different keyboard type associated with it.

If several users are using the same SoftWindows installation and have different keyboard types, it may be necessary to modify the KEYB line in the AUTOEXECBAT file as required for each user.

These files should be used as indicated below:

Table 12-2 Keyboard Options

Keyboard file	Keyboard type
SGINDYUS.KBD	SGI French, German and UK Type 4
C:\DOS\KEYBOARD.SYS	DEC French, German and UK PCXAL, HP French, German and UK ITF, HP French, German and UK PS2 (700RX/740), SGI French, German and UK Iris Indigo

Example

For a workstation with a German keyboard, in AUTOEXECBAT include the line:

KEYB GR,850,C:\DOS\KEYBOARD.SYS

Note: You should also be sure to select the correct keyboard mapping file for the type of keyboard which you have. Refer to *Setting up keyboards*.

See also C\DOS\KEYBCOM (standard MS-DOS command).

UNIX2DOS.EXE

See DOS2UNIX.EXE.

USECD.BAT

This command is used in DOS mode only. It loads the MS-DOS MSCDEXEXE program, to enable a CD-ROM device to be configured as the F. drive.

C:\INSIGNIA\CDROMSYS, the Insignia CDROM interface driver, must already be loaded in CONFIGSYS when USECDBAT is run. The Unix device name is configured in the SoftWindows Open Disk Drives dialog box.

Example

USECD F: DIR

See also "CDROM.SYS," and "Using CD-ROMs" in the SoftWindows95 for Unix User's Guide.

WINLIC.EXE

An application licensing utility that checks licenses for Windows applications. WINLICEXE must be loaded when Windows starts up by including a line in the [windows] section of the user's WIN.INI file.

Note: WINLICEXE does not need to be loaded if only MS-DOS applications are to be licensed.

Example

In C:\WINDOWS\WININI, include the following line in the [windows] section:

load=c:\insignia\winlic.exe

See also "DOSLICEXE"

Unix utilities

cphd

Copies old SoftPC hard disk files.

SoftPC used sparse hard disk files, which in some cases might contain a hole in the middle of the disk, whereas SoftWindows disks expand as required and do not contain holes. If you use the normal ϕ command to copy a SoftPC disk, you may find that the resulting hard disk file is incomplete. The ϕ hd avoids this problem.

Example

% cphd oldspc.hdf /tmp/temp.hdf

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 AUTOEXECBAT to unixautobat in Unix format:

% dostounix AUTOEXEC.BAT unixauto.bat

To convert the Unix profile file to PROFILETXT in MS-DOS format:

% unixtodos .profile PROFILE.TXT

mkhd

Creates a new, empty SoftWindows hard disk file without MS-DOS and unformatted with no partitions on it.

To partition and format the disk for use under SoftWindows, start up SoftWindows with the new hard disk file as drive D: and the default SoftWindows hard disk file MS-WIN-311hdf as drive C:

Then proceed as follows:

- 1. Run the MS-DOS command FDISK to create an MS-DOS partition on the disk.
- 2. Select option 5. Change current fixed disk drive.
- 3. Select disk 2.
- 4. Select 1. Create DOS partition or Logical DOS Drive.
- 5. Select 1. Create Primary DOS Partition.

FDISK will now ask you if you wish to use the whole disk for your new partition.

6. Answer Y.

Once the partition is made, you can use the Esc key to exit out of FDISK, which will then reboot SoftWindows.

Once SoftWindows has rebooted, you must format the D drive as follows so that it can be used with MS-DOS:

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

FORMAT D:

Alternatively if you want to be able to use the new disk as a bootable C drive:

```
FORMAT D: /S
C:\INSIGNIA\MAKEBOOT 1
```

The disk is now ready for use.

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 "Auto flush," in the Printing, input, and output section of *User's Guide*.

unixtodos

See "DOS2UNIX.EXE."

Error messages

Additional information may be appended to the end of an error if appropriate.

Error 0:

 $\ensuremath{\text{0}}\colon$ The SoftWindows CPU has encountered an illegal instruction.

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.

Re-install your PC application and/or try running it on a real 486 PC.

Error 4:

4: The hard disk file cannot be found.

Verify the name of the hard disk file you have specified.

Error 5:

5: Floppy drive problem. The drive is already in use, so it cannot be used by SoftWindows.

The floppy drive which SoftWindows is attempting to access is being used by another Unix process.

Shut down the other program which is using the floppy drive and activate the drive by choosing Actions from the Activate menu.

Error 6:

6: The hard disk path name is invalid.

SoftWindows cannot find the directory you have specified for the hard disk file.

Verify and correct the directory name. If the path to the hard disk file contains an environment variable (such as \$HOME), 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.

Error 7:

7: The hard disk is not writable - please check file name and permissions.

You do not have write permission for the hard disk file.

Verify that you have both read and write permission for the hard disk file.

If necessary use the Unix chmod command to modify the permissions to ensure that the user has proper access to the file.

Error 8:

8: The hard disk file is not a valid hard disk (disk geometry incorrect).

SoftWindows does not recognize the specified file as a valid hard disk file.

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.

Error 10:

10: The new hard disk file could not be created.

SoftWindows could not create the specified hard disk file.

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.

Error 11:

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.

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 RO_DISK_PANEL_DISABLE in your SoftWindows configuration file.

Error 12:

12: Internal error in SoftWindows procedure.

Contact Insignia Technical Support.

Error 13:

13: The host filesystem directory cannot be found.

SoftWindows cannot access the directory specified for an FSA drive.

Verify that the specified directory exists and that you have appropriate permissions on it. If the path contains an environment variable (such as \$HOME), 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.

Error 14:

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.

Error 15:

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.

Error 16:

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.

Error 17:

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 QBASIC supplied with SoftWindows or another BASIC interpreter.

Error 20:

```
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.

Error 21:

21: The file named below is not a valid keyboard file.

SoftWindows does not recognize the file as containing valid keyboard mapping information.

Verify the path and filename for the mapping file. Normally these should refer to a file in \$\$WINHOME/keyboard, and the filename should end in .kbd.

If these are correct, the mapping file may be corrupted and should be re-installed.

Error 23:

23: The file named below is not accessible to SoftWindows.

Verify the path and filename and the permissions on both the directory and the file. If the path contains an environment variable (such as \$HOME), 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.

Error 24:

24: A continuous RESET state has been entered.

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.

Re-install your PC application and/or try running it on a real 486 PC.

Error 25:

25: Invalid Extended Memory size.

The configured Extended Memory size is greater than the maximum value permitted by the MEMORY_EXTENDED_MAX_SIZE entry in the system configuration file (sysswinconfig).

Reduce the configured Extended Memory size or increase the value of MEMORY_EXTENDED_MAX_SIZE in the system configuration file.

Error 27:

27: Invalid Autoflush Delay.

The configured Autoflush Delay is greater than the maximum value permitted.

Change the Autoflush Delay to a value in the range 1 to 300.

Error 28:

28: The window manager is not configured to display the requested video mode.

SoftWindows has been asked to display in a mode that is too large for the screen configuration.

If you are using a PC application that requests a high resolution video mode, configure it to use a lower resolution mode.

Error 29:

29: Serial Terminal problem. Graphics mode not available.

With SoftWindows running on a serial terminal, a PC application has attempted to use a graphics mode. Graphics modes are not available on serial terminals.

It may be possible to reconfigure the PC application to use text modes only. Otherwise you must use SoftWindows on an X display.

Error 30:

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.

Error 31:

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.

Error 32:

32: The drive is not being used.

The NET USE X: /D command has been used on a drive which is not currently been configured as an FSA drive.

Verify that you have specified the intended drive in the NET USE command.

Error 33:

33: The drive is not a network drive.

The NET USE X: /D command has been used on a drive that is not an FSA drive.

Verify that you have specified the intended drive in the NET USE command.

Error 34:

34: The 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 NET USE command. Use the NET USE *X*: /D command to disconnect the drive before setting it up.

Alternatively, use the Open Disk Drives dialog box to configure the FSA drive as required.

Error 35:

35: The host filesystem directory cannot be found.

SoftWindows cannot access the directory specified for an FSA drive.

Verify that the specified directory exists and that you have permission to access it. If the path contains an environment variable (such as \$HOME), 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.

Error 36:

36: The host filesystem directory must be a directory.

The path specified for an FSA drive does not specify a directory.

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.

Error 37:

 $37\colon$ The host filesystem directory must have read access.

You do not have read access for the directory specified.

Verify that you have appropriate permissions on the directory.

Error 39:

```
39: Illegal drive specification.
```

You have tried to set up an FSA drive beyond the value of LASIDRIVE set in CONFIGSYS.

Change LASIDRIVE in CONFIGSYS to a higher letter, or use a drive which is not greater that the value of LASIDRIVE.

Error 40:

```
40: The font files could not be opened by SoftWindows.
```

The X server cannot load fonts required by SoftWindows.

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:

```
% xset +fp $SWINHOME/fonts/dir
% xset fp rehash
```

where *dir* is a directory which depends on the type of platform being used to display SoftWindows.

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.

Error 41:

41: X Windows System compatibility problem. The visual class is other than StaticGray, GrayScale or Pseudocolor.

The X display does not support a visual class which SoftWindows requires for color or grayscale display.

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.

Error 43:

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:

SoftWindows failed to open a pipe and execute the command specified for the port.

Verify that the command is available to SoftWindows (via PATH or a fully specified directory), has appropriate permissions, and operates correctly when data is piped into its standard input.

Error 44:

44: The memory resources needed by SoftWindows could not be allocated. Select Continue to retry.

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.

Error 46:

46: SoftWindows cannot continue because the environment variable SWINHOME is not set.

Ensure that SWINHOME is set in the environment before SoftWindows is started. SWINHOME should be set to the full path of the directory in which SoftWindows is installed (such as /usr/SoftWindows95).

Error 47:

47: An installation file required by SoftWindows is missing, execution must terminate.

Verify that the SWINHOME is set in the environment, and indicates the correct directory for the SoftWindows installation. Also verify that \$HOME 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 re-installed.

Error 48:

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.

There is an invalid entry in \$SWINHOME/sysswinconfig or \$HOME/swinconfig.

Enter the correct value in the dialog or exit SoftWindows and correct the file using a text editor. If the error is in \$HOME/swinconfig, the new value entered will take effect the next time the SoftWindows configuration is saved.

If the error is in \$SWINHOME/sysswinconfig, this message will be displayed each time SoftWindows is started. In this case \$SWINHOME/sysswinconfig should be edited using a text editor to correct the entry.

Whenever \$SWINHOME/sysswinconfig is edited verify that it is owned by root and has the SUID bit set.

Error 49:

49: Serial terminal problem. Communications error while writing to terminal.

Verify that the terminal is correctly connected to the workstation, is configured correctly, and that the device is not being used by another Unix application.

Error 50:

50: The configuration file is missing from your home directory. Select Default and a copy will be made from the system defaults.

The file \$HOME/swinconfig 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.

The new file will use default values from the system configuration file (\$SWINHOME/sysswinconfig). If you have used a previous version of SoftPC or SoftWindows, you may want to copy some entries from your previous configuration file.

If you have used SoftWindows 95 before, and believe you have saved a configuration, verify that the value of \$HOME is set correctly when SoftWindows is started.

Error 51:

51: The configuration file in your home directory cannot be written to by SoftWindows.

You cannot write the file because of a permissions problem or lack of available disk space.

Verify that the value of \$HOME 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.

Error 52:

52: Serial terminal problem. The port to which your serial terminal is trying to attach is already in use.

Another Unix process is using the serial terminal which you are trying to access. Identify the relevant process and stop it or disable its connection to the serial port. Alternatively, you may be able to use a different serial port with SoftWindows. Verify that there is no getty process running on this port. If there is, disable it by modifying the /etc/inittab file.

Error 53:

53: Serial terminal problem. The serial terminal port could not be opened.

Verify that you have used the correct serial terminal port device name and that you have both read-write permission to it. On many systems, the system administrator must change permissions on the device before it can be used by most users.

Error 54:

 $54\colon$ Serial terminal problem. SoftWindows cannot open the term info file to get the information for $\mbox{\tt \$TERM}.$

The terminal description file in \$SWINHOME/term is corrupted.

Re-install SoftWindows or restore the terminal description file from backups.

Error 55:

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.

Error 56:

56: The configuration file in your home directory has an option with a bad value.

Edit the configuration file in your home directory (swinconfig) to correct the value.

Error 57:

57: The system default configuration file has an invalid value.

Edit the system default configuration file (\$SWINHOME/sysswinconfig) to correct the value. After editing the file, verify that the file is owned by root and has the SUID bit set.

Error 58:

58: The system default configuration file has a duplicate or unrecognized entry.

Edit the system default configuration file (\$SWINHOME/sysswinconfig) to correct the value. After editing the file, verify that the file is owned by root and has the SUID bit set.

Error 59:

59: The system default configuration file has a missing entry.

Edit the system default configuration file (\$SWINHOME/sysswinconfig) to add the required entry. After editing the file, verify that the file is owned by root and has the SUID bit set.

Error 60:

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 (\$HOME/swinconfig) is invalid. If the error is continually given, there are two possible causes:

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.

Alternatively, the system default configuration file (\$SWINHOME/sysswinconfig) 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.

Error 61:

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.

A required value is missing from your configuration file (\$HOME/swinconfig).

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 (\$HOME/swinconfig) to avoid the error recurring the next time SoftWindows is started.

Error 62:

62: SoftWindows cannot continue due to insufficient resources from the Native Language Support message catalogue.

SoftWindows cannot find the required text in its message catalogue.

The message catalog may be corrupted. The file should be restored from backups or SoftWindows should be re-installed. The message catalog file is \$SWINHOME/nls/C/swincat. If the message catalog file is removed, SoftWindows will use English text by default.

Error 65:

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.

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.

Verify that the lock daemon, normally called lockd or pclockd, is running on the workstation on which SoftWindows is running and on the workstation on which the indicated file is located.

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.

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 (\$HOME/swinconfig), which SoftWindows opens and writes to very quickly, then continuing is unlikely to damage the file, but it is still a possibility.

Error 66:

66: The date has been set forward, or the system frozen for a period. The PC date may be incorrect.

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.

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.

Error 67:

67: The date has been set backward. The PC date may be incorrect.

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.

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.

Error 68:

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.

You have selected an invalid device name for the floppy drive.

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.

Error 69:

69: Could not allocate 256 colors for Windows.

You can try stopping other applications to free color resources, then press Continue or try to allocate 16 colors by pressing Default.

Error 70:

70: Could not allocate 16 colors for Windows.

You can try stopping other applications to free color resources, then press Continue or use another colormap by pressing Default.

Error 71:

71: The hard disk is being mounted read-only because it is being accessed by another user:

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.

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.

Now Activate the disk or restart SoftWindows on the session which must write to the disk.

Error 72:

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.

SoftWindows could not identify the user who is using a hard disk file or cannot communicate with the lock daemon.

There may be a problem with the lock daemon. It may need to be restarted.

Error 73:

73: SoftWindows was unable to open the default terminal description file:

SoftWindows cannot open the file \$SWINHOME/term/ansi (HP and SPARC products).

This file should be restored from backup, or SoftWindows should be re-installed.

Error 74:

74: SoftWindows was unable to open the terminal description file. Press continue to use the default below.

SoftWindows could not load the terminal description file for the type of terminal specified. An attempt can be made to continue, using a default terminal description file.

Verify that you have specified the correct terminal type on the SoftWindows command line and that the corresponding terminal description file is in the \$SWINHOME/term directory.

Error 75:

75: A configuration file entry is duplicated or there is an unrecognized entry. You may select Default to ignore this entry, or select Edit to alter the configuration file.

Your configuration file (\$HOME/swinconfig) has an invalid entry.

Select Edit to correct the error. If you do not correct the error now, the configuration file will be corrected the next time the configuration is saved.

Error 76:

76: An error occurred processing the configuration file entry shown below. You may select Default to replace it with the system default value, or select Edit to alter the configuration file.

Your configuration file (\$HOME/swinconfig) has an invalid entry.

If the system default value is acceptable, select Default. Otherwise select Edit to correct the configuration file entry.

Error 77:

77: The configuration file entry shown below is empty. You may select Default to use the system default value, or select Edit to alter the configuration file.

The indicated entry is missing from the configuration file (\$HOME/swinconfig).

If the system default value is acceptable, select Default. Otherwise select Edit to enter a suitable configuration file entry.

Error 78:

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.

Your display does not have sufficient colors available for SoftWindows to correctly emulate PC graphics adaptors.

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.

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.

Error 80:

80: An unexpected file system error occurred while reading from a container file. Pressing Continue will retry the operation that failed.

SoftWindows is unable to read the hard disk file used as the C or D drive.

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.

Error 81:

81: An unexpected file system error occurred while writing to a container file. Pressing Continue will retry the operation that failed.

SoftWindows is unable to write to the hard disk file used as the C or D drive.

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.

Error 82:

82: SoftWindows has encountered a problem with the licensing system.

SoftWindows cannot find a valid license.

User: Verify that LM_LICENSE_FILE is set in your environment when SoftWindows is started. The value should normally be <code>install/FLEXIm/licensedat</code>, where <code>install</code> 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.

Administrator: Verify that you have a valid SoftWindows license and that it has not expired. Your FLEXIm license file should contain a FEATURE line for Insignia_SoftWindows, and a DAEMON line for the insignia daemon. If you are using local licensing, verify that both Imgrd and insignia daemons are running, and are using the correct license file. Verify that the value of LM_LICENSE_FILE indicates this same license file when SoftWindows is started.

If you are using a remote license server, verify that both lmgrd and insignia daemons are running on it and are using the correct license file.

Verify that when SoftWindows is started, the value of LM_LICENSE_FILE indicates the correct license server name and TCP port number in the form port@lost, for example, 744@icserv. Verify that the network connection is operating correctly between the license server and workstation.

Verify that the date and time are set correctly on both the license server and the workstation on which SoftWindows is to be run.

Error 83:

83: Your current SoftWindows license has expired. Apply to your SoftWindows dealer for a full license.

A SoftWindows 2 license has been found, but it has expired.

Apply to your SoftWindows dealer for a full license.

Error 84:

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.

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.

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.

The system administrator should verify operation of the license server, the Imgrd and insignia 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.

Error 88:

 $88\colon \mbox{All licensed SoftWindows}$ are already running. Please contact your Customer Service Representative.

You are already running the full number of copies of SoftWindows for which you have licenses installed.

Purchase and install additional SoftWindows licenses or close down an existing invocation of SoftWindows before starting the new one.

Error 89:

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.

Error 90:

90: Failed to start the lmgrd daemon. Please run again to retry.

SoftWindows could not start up the license daemon Imgrd.

Verify that the license daemon executable (\$SWINHOME/FLEXIm/Imgrd) 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.

Error 91:

91: Failed to update the /etc/inittab file.

SoftWindows must update the file /etc/inittab to ensure that the licensing daemon starts when the workstation is booted. It was unable to do so.

Edit the /etc/inittab file or another startup script to ensure that the licensing daemon is started when the workstation starts up. The SoftWindows line in /etc/inittab is: isl:234:respawn:install/FLEXlm/lmgrd -c install/FLEXlm/license.dat >> install/FLEXlm/license.log 2>&1

where install is the SoftWindows installation directory.

Error 92:

92: Failed to update the license file.

SoftWindows was unable to create or modify the license file \$SWINHOME/FLEXIm/licensedat.

The Unix error message indicating the type of problem is displayed. This information should enable the system administrator to address the problem.

Error 93:

93: This version of the SoftWindows display driver cannot run in Enhanced mode. Please install the version supplied with SoftWindows.

The file SPCMSWDDVR in your Windows installation is incompatible with the version of SoftWindows you are using.

Update SPCMSWD.DVR to the version supplied with your SoftWindows distribution (\$SWINHOME/windows).

Error 94:

```
94: Too many programs EXEC'ing other programs. (Max depth:10)
```

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.

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.

Error 95:

95: The license for this application is out of date.

The expiry date for a licensed MS-DOS or Windows application has passed.

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.

Error 96:

96: All licensed copies of this application are already running.

The maximum number of licensed copies of the MS-DOS or Windows application are already in use.

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.

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.

Error 97:

```
97: Failed to update the /etc/rc.local file.
```

SoftWindows must update the file /etc/rclocal to ensure that the licensing daemon starts when the workstation is booted. It was unable to do so.

Edit the /etc/rclocal file or another startup script to ensure that the licensing daemon is started when the workstation starts up.

The required section in /etc/rclocal is of the form:

```
# # 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
```

where install is the SoftWindows installation directory.

Error 98:

```
98: Cannot overwrite the current C: drive.
```

The filename entered for the new hard disk already exists and is being used as the C drive.

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.

Error 99:

```
99: This exists and is a directory, please enter a file name.
```

The name given for a new hard disk file exists and is a directory. Select another name for the new hard disk.

Error 102:

102: 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
```

Error 103:

103: 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 HIT instruction with all interrupts disabled. On a real PC this would lock up the PC.

Restart SoftWindows from the Actions menu.

Error 1001:

1001: Unable to open Native Language Support catalog, defaulting to English.

SoftWindows cannot access the file \$SWINHOME/nls/C/swincat. This file is the Native Language Support Catalog, required for SoftWindows messages.

Verify that \$SWINHOME/nls/C/swincat is installed and readable by SoftWindows. If you have LANG set in your environment, set it to C before starting SoftWindows.

Error 1002:

1002: Serial terminal problem. SoftWindows cannot communicate with the terminal.

SoftWindows cannot access the terminal you are using.

Verify that you have read and write permissions on the serial terminal device.

Error 1003:

1003: Serial terminal problem. SoftWindows cannot select the terminal. Fatal problem with communications to the serial terminal.

SoftWindows cannot access the terminal you are using.

Verify that you have read and write permissions on the serial terminal device.

Error 1004:

1004: The device specified is not a valid special character device.

The file name given as the CDROM device or COM port is not a character device.

Verify that you have specified the correct device name.

Error 1005:

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 PATH set in your environment.

If the command is not accessible, either modify the PATH before starting SoftWindows or specify the full Unix path to the command in the SoftWindows Comms Port or Printer Port dialog box.

Error 1006:

1006: The file needed by the port adapter is already being accessed.

The file name given for use with a comm 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 comm port or printer port or if you have another invocation of SoftWindows using the same filename.

Close down the Unix process using the file or select an alternative filename.

Error 1007:

1007: SoftWindows does not have access to the CDROM device name.

The user does not have read permission for the CD-ROM device.

Verify that you have read permission for the CD-ROM device. If necessary, use the Unix dmod command to modify the permissions. Verify that you have specified the correct device name.

Error 1008:

1008: Your system is low on swap space.

Continuing without increasing available memory may make programs fail unexpectedly.

Increase the swap space or shut down some Unix applications to increase the available memory.

Error 1009:

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.

The X Server used to run SoftWindows is not supported by SoftWindows.

Upgrade your X server to the recommended version or run SoftWindows on another display.

Error 1010:

1010: The Unix command linked to a COM or LPT port has failed. All port operations are halted.

The process being used for a COM port or printer has died and no more data can be output to this process.

Verify that the command being used is valid and that it is functioning correctly.

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.

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.

Error 1021:

1021: Unable to open the host's network interface.

The SoftWindows ODI 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.

Verify that the host's network device is installed and configured correctly.

Verify that no other Unix applications are using the network device.

Verify that the SoftWindows executable is owned by root and has the SUID bit set.

Error 1022:

1022: Unable to configure the host's network interface.

The SoftWindows ODI 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.

Verify that the host's network device is installed and configured correctly.

Verify that no other Unix applications are using the network device.

Verify that the SoftWindows executable is owned by root and has the SUID bit set.

Error 1023:

1023: Unable to enable packet filtering.

The SoftWindows ODI driver could not enable the low level network packet filtering algorithms needed. SoftWindows will be unable to use PC networking if this error occurs.

Verify that the host's network device is installed and configured correctly.

Verify that no other Unix applications are using the network device.

Verify that the SoftWindows NETCFG file has no illegal PROTOCOL entries.

Error 1024:

1024: Unable to flush the host's network interface.

The SoftWindows ODI driver could not flush the low level network device. SoftWindows may not be able to use PC networking if this error occurs.

Verify that the host's network device is installed and configured correctly.

Verify that no other Unix applications are using the network device.

Error 1025:

1025: Unable to read the host's network address.

The SoftWindows ODI driver could not access the host's network address. SoftWindows will be unable to use PC networking if this error occurs.

Verify that the host's network device is installed and configured correctly.

Verify that no other Unix applications are using the network device.

Verify that the SoftWindows executable is owned by not and has the SUID bit set.

Error 1026:

1026: Unable to enable a SIGIO handler.

The SoftWindows ODI 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.

Verify that the host's network device is installed and configured correctly.

Verify that no other Unix applications are using the network device.

Error 1027:

1027: Unable to bind to the host's network provider.

The SoftWindows ODI 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.

Verify that the host's network interface is installed and configured correctly.

Verify that no other Unix applications are using the network device.

Verify that the SoftWindows executable is owned by root and has the SUID bit set.

Error 1028:

1028: Unable to attach to the host's network provider.

The SoftWindows ODI 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.

Verify that the host's network interface is installed and configured correctly.

Verify that no other Unix applications are using the network device.

Verify that the SoftWindows executable is owned by not and has the SUID bit set.

Error 1029:

1029: Unable to enter host network's promiscuous SAP mode.

The SoftWindows ODI driver could not enter Promiscuous SAP mode. SoftWindows will be unable to use PC networking if this error occurs.

Verify that the host's network device is installed and configured correctly.

Verify that no other Unix applications are using the network device.

Verify that the SoftWindows executable is owned by not and has the SUID bit set.

Error 1030:

```
1030: Unable to retrieve the host interface's physical location (PPA).
```

The SoftWindows ODI driver could not find the correct network device to use. SoftWindows will be unable to use PC networking if this error occurs.

Verify that the host's network device is installed and configured correctly.

Verify that no other Unix applications are using the network device.

Verify that the SoftWindows executable is owned by not and has the SUID bit set.

Error 1031:

```
1031: Unable to close host's network interface.
```

The SoftWindows ODI driver could not close the host's network device. SoftWindows may not be able to use PC networking when next used.

Verify that the SoftWindows executable is owned by root and has the SUID bit set.

Error 1032:

```
1032: Unable to add protocol to network interface.
```

The SoftWindows ODI driver could not assign the requested protocol. SoftWindows will be unable to use PC networking if this error occurs.

Verify that the SoftWindows NETCFG file has no illegal PROTOCOL entries.

Verify the supported protocols for this SoftWindows platform.

Verify that no other Unix applications are using the network device.

Error 1033:

1033: Unable to delete protocol from network interface.

The SoftWindows ODI driver could not remove the previously assigned protocol. SoftWindows may not be able to use PC networking when next used.

Verify that the SoftWindows NETCFG file has no illegal PROTOCOL entries.

Verify the supported protocols for this SoftWindows platform.

Verify that no other Unix applications are using the network device.

Error 1034:

1034: Unable to transmit packet onto network cable.

The SoftWindows ODI driver could not transmit a packet onto the network. SoftWindows may be unable to use PC networking 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.

Verify that the protocol that you are using is supported by SoftWindows on this platform.

Error 1035:

1035: Partial packet received from host's network interface.

The SoftWindows ODI 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 not 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.

Error 1036:

1036: Unable to enter promiscuous mode.

The SoftWindows ODI 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.

Error 1037:

1037: Unable to exit promiscuous mode.

The SoftWindows ODI 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.

Error 1038:

1038: Unable to add multicast address.

The SoftWindows ODI 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.

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.

Error 1039:

1039: Unable to delete multicast address.

The SoftWindows ODI 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.

Verify that the SoftWindows executable is owned by not 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.

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