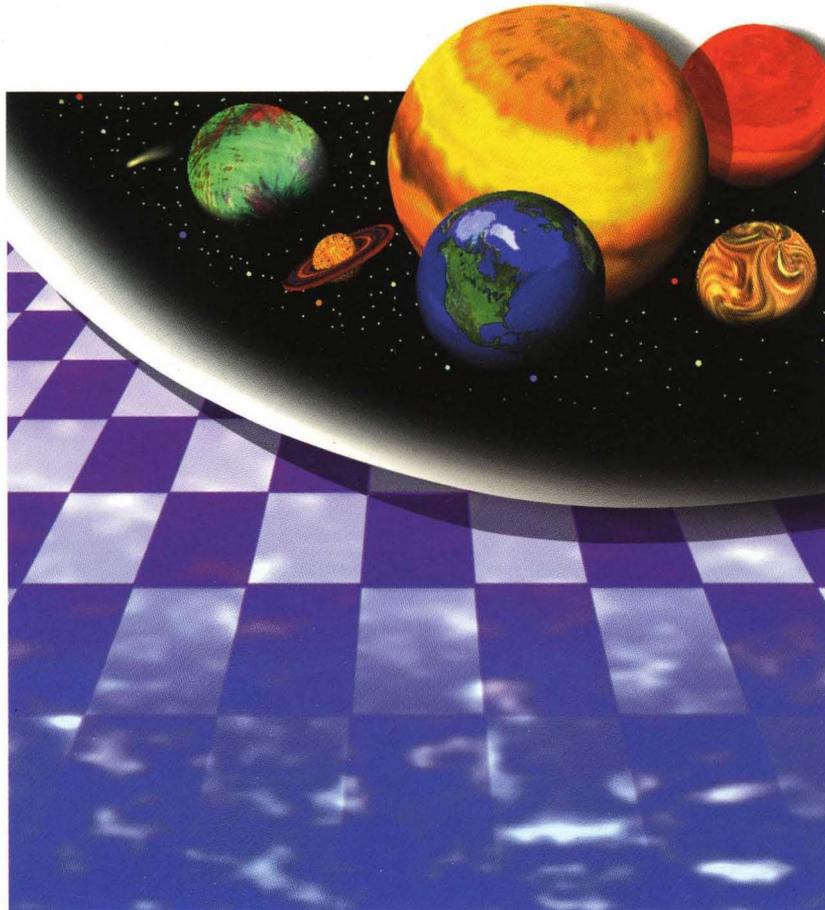


IRIS® Software Installation Guide



IRIS® Software Installation Guide

Document Number 007-1364-040

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Mountain View, California

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To the Reader

The standard manual set includes the *IRIS Workspace User's Guide*, the *Personal System Administration Guide*, the *IRIS Utilities Guide*, the *Owner's Guide* for your model of workstation, and the *IRIS Software Installation Guide*. Below you'll find a brief description of each book. For more detailed information on a particular book, see the first chapter in that book.



Owner's Guide — Explains how to install and maintain your hardware.



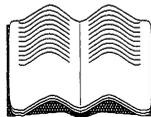
IRIS Essentials — Explains how to use your system. It includes a tutorial and step-by-step instructions for using the IRIS[®] WorkSpace™ to perform common tasks such as copying files, creating new directories, setting permissions, and more. Also serves as a reference — a place to look when you need to know what a particular command does or on which menu it appears.



Personal System Administration Guide — Explains how to *manage* your workstation — create and modify a login account, set up your IRIS as part of a network, back up your work, and more. If you are responsible for managing many workstations or a large network, also see the *IRIX Site Administrator's Guide*.



IRIS Utilities Guide — Describes a suite of desktop tools, including mail, a basic text editor named *jot*, a calculator, clocks, and *CDPlayer*, a program for playing compact discs.



IRIS Software Installation Guide — Explains how to install Silicon Graphics software products. It covers basic installation procedures, customization techniques, and troubleshooting. Also serves as a complete reference for the installation program, *inst*.

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Introduction

The *IRIS Software Installation Guide* explains how to install Silicon Graphics® software products. It is a complete guide to the IRIX™ installation program *inst(1M)* and other tools and procedures used during the software installation process. This guide is intended for everyone who installs Silicon Graphics software on IRIS®-4D™ Series workstations. This edition of the *IRIS Software Installation Guide* applies to all IRIX Releases 4.0 through 4.0.5H and 5.0. The workstation CPU types IP4, IP5, IP6, IP7, IP9, IP12, IP17, IP19, IP20, and IP22 are covered.

Organization of This Guide

This guide is organized into 10 chapters:

- Chapter 1 “Installation Process Overview” uses a simple flowchart to give readers the “big picture” of the software installation process and begins defining the specialized terminology used throughout this book. Two sample installation sessions introduce the commands that are used during installation and can also be used as quick reference guides.
- Chapter 2 “Software Distributions” discusses Silicon Graphics software distributions: their format, the media they are shipped on, how they are labeled, where they can be read, the two types of software distributions and two special categories of software called required and default. More terminology is introduced in this chapter.

- Chapter 3 “Site Preparation” explains site preparation tasks that are required if you want to install software from disk rather than tape or CD, and if you are installing software over the network.
- Chapter 4 “Bringing Up *inst*” is the first of three chapters that explain the steps you perform each time you do a software installation. It explains choosing your software distribution source, an installation method, and the order that you install your software distributions. It also explains strategies for backing up your workstation prior to beginning an installation. The last sections explain the steps for invoking *inst* in detail for all combinations of distribution sources and installation methods.
- Chapter 5 “Using *inst*” explains how to use the commands on the *inst* menus to install and remove software. It presents this information in three forms: an overview of the *inst* model of installation, figures that categorize the commands by their functions, and sample annotated *inst* sessions. This chapter also gives directions for changing tapes, CDs, and distribution directories, and provides hints on getting help if you need it during installation.
- Chapter 6 “Finishing Up Installation” is the final chapter of installation steps. It explains how to confirm your installation and exit *inst*. It also explains a final installation step that is sometimes required: modifying files (called configuration files) that contain information specific to your workstation.
- Chapter 7 “Tips, Tricks, and Advanced Features” is a collection of *inst* features and shortcuts that will be of interest to frequent users of *inst* and those who want to learn more about *inst*’s capabilities.
- Chapter 8 “Installation Troubleshooting” contains information about error messages and diagnostic procedures. It explains what you can tell about errors from the format of the messages and gives some diagnostic procedures that are useful for many types of errors. It lists error messages that are organized by stage of installation (matching Chapters 4, 5, and 6). Each message is followed by possible causes and suggestions on how to recover.

- Chapter 9 “Installation Strategies” covers the finer points of installing specific types of software and special installation situations. It covers software product releases, maintenance releases, and software updates. It discusses installing software on an empty disk, on a disk for another workstation, for diskless workstations, and after a hardware upgrade. It also covers the procedure for installing a software release that is older than the one presently installed.
- Chapter 10 “*inst* Commands Reference” is a complete reference for *inst* menu commands: their syntax, their functionality, and the output they display.
- Index The Index contains entries for each of the *inst* commands, each IRIX command mentioned in this guide, each variable used in this guide, all special installation terms, each punctuation character that has a special meaning to *inst*, and more. In particular, the entry “error messages” lists the key words in each error message explained in Chapter 8.

How to Use This Guide

Four strategies can be applied to using this guide. The strategy you choose depends on whether you are:

- a first-time installer of software on IRIS-4D Series workstations
- an occasional installer of software
- a frequent installer of software, interested in becoming more proficient
- a System Administrator

For all users, an understanding of the terminology and models of installation makes the installation procedure go more smoothly. While using *inst*, knowing what to expect and what to do next makes changing large numbers of files on your workstation less intimidating and confusing. Section 1.1, “Installation Process Model,” Section 4.1, “Overview of Bringing Up *inst*,” Section 5.1, “Overview of Using *inst*,” and Section 6.1, “Overview of Finishing Up Installation” explain the models and define most of the terminology.

The remainder of this section suggests strategies for using this guide for each type of user.

- First-time users

First-time users should read Chapters 1, 2, and 3 before beginning an installation. These chapters introduce the user to the basic installation model and terminology and help the user prepare the site and decide which software to install.



Chapters 4, 5, and 6 offer guidelines for performing the software installation. Troubleshooting information can be found in Chapter 8. Chapter 10 provides answers to questions about specific *inst* commands.

The first-time user probably will not need Chapters 7 and 9.

- Occasional users

The installation model and terminology should be familiar to users who install software only occasionally.

Occasional users should follow the steps in Chapters 4, 5, and 6 to perform the installation and refer to Chapters 8 and 10 if necessary for troubleshooting and reference information. When faced with an installation task different from any they have performed before, reading the appropriate section in Chapter 9 could be helpful.

Chapters 1, 2, 3, and 7 probably will not be needed by users who install software only occasionally.

- Frequent software installers

Although they probably understand the installation process well, users who install software frequently are likely to need Chapter 4 for most Miniroot Installations (defined in Chapter 1) in order to get the details right. Frequent users will find the shortcuts and advanced techniques in Chapter 7 very helpful. They may also find the information in Chapter 9 helpful if they encounter a variety of installation situations. Reference information in Chapters 8 and 10 is available if needed.

Frequent software installers probably will have little need of the information in Chapters 1, 2, 3, 5, and 6 except as reference information.

- Site or System Administrators

Site or System Administrators who perform many installations need to become familiar with the installation process by reading Chapters 1 through 6 just as other users do. They should pay particular attention to Chapter 3, because they may be responsible for the site preparation tasks it describes. The techniques in Chapter 7 provide shortcuts and additional features that are often useful. Reading the first two sections of Chapter 8 and all of Chapters 9 and 10 is also a good way to learn all of the details of the installation process and the capabilities of the tools.

Notation Conventions

Various font and syntax conventions are used in this guide. Examples and their meanings and uses are explained below.

inst The names of IRIX and Command Monitor commands in the text are in *italics*.

versions(1M) The first mention of an IRIX command in a chapter is followed by a manual page section number.

/etc/passwd File names in text are in *italics*.

nfs, eoe2.man, eoe1.sw.unix Product names, image names, and subsystem names in text are in *italics*.

netaddr The names of non-volatile random access memory (NVRAM) and PROM Monitor variables are in *italics*.

<server> User-supplied strings are in *italics* surrounded by angle brackets.

(comment) Some output text of *inst* examples is replaced by a comment in *italics* surrounded by parentheses.

`list` *inst* commands and their arguments are in typewriter font in text and examples. All command output (IRIX, PROM Monitor, or *inst*) in examples is shown in typewriter font.

from Literal user input in text and examples is in **bold typewriter** font.

- <Esc> The names of nonprinting keyboard keys that must be pressed by the user are in **bold typewriter** font surrounded by angle brackets.
- f Literal IRIX command arguments are in **bold** in text.
- i Single letter codes used in *inst* are in **bold** when they are used in text.

**installation
terminology**

The first use of a word that is special *installation terminology* is in *italics*. It is followed by a definition which is marked by the word or term in the left margin.



Key points are highlighted with a hand in the left margin. It points to the line that contains the beginning of the important sentence.

Flowcharts are used in this guide to describe the installation process:

- Rectangles indicate steps in the process and usually correspond to sections in this guide.
- Diamonds show major decision-making points.
- Paths coming out of diamonds show the choices that can be made at the decision-making points.
- Next to some rectangles and diamonds is the number of the section that explains that step or decision.

All examples of the commands you enter are shown with prompts. The following list includes all of the prompts shown in this guide and explains each one.

- * This IRIX shell prompt is used when you don't need to be the superuser to give the command that follows it. Your prompt may look different, depending on the shell you are using and the prompt you've chosen.
- # This IRIX shell prompt is for the superuser (*root*). You must be the superuser when you give the command that follows this prompt.

>> This prompt is for the Command Monitor. The Command Monitor is the command interpreter portion of the PROM Monitor, a standalone program with limited capabilities. Sections 4.7.1 and 4.7.3 on Miniroot Installations describe the workstation shutdown procedure that is used to leave the IRIX operating system and run the PROM Monitor.

Inst>, Admin>, Interrupt>

These prompts are used by the 4D1-4.0 version of *inst*, the version described in this guide. Chapter 4 explains how to invoke *inst*.

Install> This prompt from the 4D1-3.3 and earlier versions of *inst* is used in Section 9.9, "Reinstalling an Older Software Release," which explains a procedure that may use one of these older versions of *inst*.

Other References

cdinstmgr(1), *clinst(1M)*, *distcp(1M)*, *eject(1)*, *inst(1M)*, *versions(1M)*

These manual pages provide installation information at the IRIX command line level. They are on-line manual pages.

Personal System Administration Guide

This guide contains directions for creating backup tapes for workstations using System Manager.

IRIX Advanced Site and Server Administration Guide

A guide for information on IRIX programs that have *inst* command counterparts such as *mkfs(1M)*, and IRIX system administration tasks.

Diskless Workstation Administration Guide

This guide, included with the Network File System product, contains information about installing software for diskless workstations.

Installation Process Overview

This chapter provides an overview of the software installation process. It also introduces important terms and gives examples of installation sessions.

Installation Process Overview

This chapter introduces you to the installation of Silicon Graphics software. In Section 1.1, the installation model is presented at a very high level to give you an understanding of the flow of installation and to introduce you to some of the installation-specific terminology that is used throughout this guide. Later sections (Section 4.1, "Overview of Bringing Up *inst*," Section 5.1, "Overview of Using *inst*," and Section 6.1, "Overview of Finishing Up Installation," in particular) discuss this model in more detail.

Section 1.2, "IRIX Installation Sample Session," and Section 1.3, "Miniroot Installation Sample Session," contain sample installation sessions to help you relate the basic model to what you see when you do an installation. They can also be used as quick reference guides once you become familiar with the installation process.

1.1 Installation Process Model

The basic model of installation is shown in Figure 1-1. For some installations, installation begins with site preparation. Often these site preparation tasks are performed once by a System Administrator in preparation for installing new software on all workstations at a site.

Each installation begins with choosing a software distribution source. This process involves identifying the 1/4-inch cartridge tapes, CDs, or specially set up directories called distribution directories that contain the software you want to install and the workstation with the tape drive, CD-ROM drive or distribution directories that you will use for the installation.

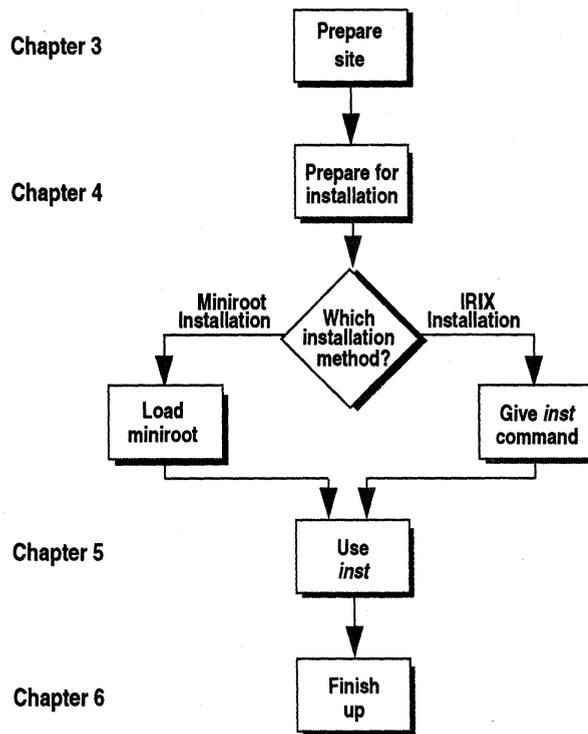


Figure 1-1 Installation Process Flowchart

Miniroot Installation



Before beginning, decide which installation method you will use: *Miniroot Installation* or *IRIX Installation*. With the Miniroot Installation method, you shut down your workstation and bring up (load) a special installation environment called the miniroot. If you are installing operating system software or other software that requires kernel reconfiguration, or you are installing software that replaces files that would be open during IRIX installation, you must use the Miniroot Installation method. The *Release Notes* for every product let you know if Miniroot Installation is required to install that product.

IRIX Installation

With the IRIX Installation method, you give the *inst* command from a shell. Not all software can be installed using this method, but it is preferred because it is less time-consuming and you can perform other tasks on your workstation during installation. When in doubt, however, use Miniroot Installation.



The next step, using *inst*, is the same for both installation methods. While you are using *inst*, you give commands that are presented on three menus. *inst* makes some initial guesses about what you want to install (newer versions of what is already installed, for instance) to speed up the selection of software to be installed. You specify additional software that you want to install, if desired, and possibly software that you want to remove, and then give a command (*go*) that does the actual installation.

Until you give the *go* command, you can pick and choose software without being committed. This enables you to make selections based on disk space constraints, if disk space is an issue. Installed, older versions of software you select for installation are automatically removed just prior to installing the new version. If you have several tapes or CDs to install, you are prompted to change tapes or CDs after the *go* command completes. After changing tapes or CDs you immediately begin to select software again.

configuration file

inst does not remove certain customizable files included in software products. An example is */etc/passwd*, a file that contains login names and passwords of users that have accounts on your workstation. This type of file is called a *configuration file*. The files that the System Manager changes when you use it to customize your workstation are configuration files. These specially-designated files might also be edited by you or a System Administrator at your site. During installation, older versions of configuration files that you've modified are saved in *.O* files, or new versions of configuration files become *.N* files rather than being installed in their default locations. The treatment of configuration files depends on whether or not they've been locally modified and the type of changes made to the file in the new release.

Once you've completed installing software with *go*, leave *inst* by giving the *quit* command. Depending on the installation method, you get a shell prompt after *inst* does final installation tasks (IRIX Installation) or your workstation goes through a reboot sequence (Miniroot Installation) and gives you a login prompt.

If *.O* and/or *.N* files have been created during your installation, a message is displayed to warn you about this. In this case, the last step of the installation is to compare the *.O* and *.N* files with their no-suffix versions, make any changes necessary to the no-suffix versions, and remove the *.O* and *.N* versions.



You find out the names of files with *.O* and *.N* versions with the IRIX command **versions changed**. If you are unfamiliar with the content of the configuration files that have changed, the System Administrator for your site or the references listed in the Introduction are good places to get more information. The algorithms for configuration file replacement are all designed so that your workstation will continue to operate in your environment after a software installation even if you ignore the *.O* and *.N* versions of the configuration files. However, it is always a good idea to merge *.O* and *.N* files, since you may experience compatibility problems if you don't.

You can use the *versions(1M)* command at any time during or after your installation to get information about the software that is installed on your workstation.

1.2 IRIX Installation Sample Session

A sample IRIX Installation session is given below. If you are installing application software (software options), you can usually use IRIX Installation. In this example, the `step` command is used to select (choose) subsystems to install, remove, or leave unchanged. An alternative set of commands for selecting software is shown in the next section.

% **/bin/su -** Become the superuser.

Password:

/usr/sbin/inst Invoke *inst*.

(initial messages appear)

If you are a first-time `inst` user, give the command "help beginner".
inst has an extensive on-line help command. To see a list of topics, give the command "help help".

Inst Main Menu

- | | |
|-------------------------------|--|
| 1. from [source] | Specify location of software to be installed |
| 2. list [keywords] [names] | Display information about software subsystems |
| 3. go | Perform software installation and removal now |
| 4. install [keywords] [names] | Select subsystems to be installed |
| 5. remove [keywords] [names] | Select subsystems to be removed |
| 6. keep [keywords] [names] | Do not install or remove these subsystems |
| 7. step [keywords] [names] | Enter interactive mode for install/remove/keep |
| 8. versions [args] | Get information about installed software |
| 9. help [topic] | Get help in general or on a specific word |
| 10. admin | Go to the Administrative Commands Menu |
| 11. quit | Terminate software installation |

Inst> **from tape** Specify the software distribution source if the desired distribution source is different from the distribution source in the initial messages. The arguments of the `from` command are discussed in Sections 4.7.6 and 10.2.

(a message about reading the installation history database and a list of products in the distribution appear)

Inst> **list** Display the subsystems available for installation and the default installation selections made by *inst*.

(disk space checking output appears, followed by a list of subsystems with their selection status, installation status, and disk space usage information)

Inst> **step** Interactively change the selection status if desired. Use <Enter> to go to the next subsystem, **i** for installation, **r** for removal, and **k** to keep installation status unchanged.

(subsystems appear one by one, followed by a disk space summary)

Inst> **go** If the disk space summary shows that you have enough disk space, start the installation and/or removal of subsystems.

(messages about images being removed and installed, followed by a completion message)

Inst> **quit** Exit *inst* if there are no more tapes to install; otherwise, insert a new tape and return to the **list** command.

(a message about exit commands might appear)

#

1.3 Miniroot Installation Sample Session

A sample Miniroot Installation session is given below. If you are installing basic operating system software and certain other types of software, you must use Miniroot Installation. The distribution source in this example is a remote distribution directory. In this example, the `install` and `remove` commands are used to select (choose) subsystems for installation and removal. An alternative command for selecting software, `step`, is shown in the previous section.

```
% /bin/su -                               Become the superuser.
Password:
# /etc/shutdown                           Begin the shutdown process that takes the workstation to the
                                           PROM Monitor.
```

(The commands you give after system shut down and before inst comes up vary with the workstation model and distribution source. See Chapter 4, "Bringing Up inst," for details.)

If you are a first-time `inst` user, give the command "help beginner".
`inst` has an extensive on-line help command. To see a list of topics, give the command "help help".

Inst Main Menu

1. from [source]	Specify location of software to be installed
2. list [keywords] [names]	Display information about software subsystems
3. go	Perform software installation and removal now
4. install [keywords] [names]	Select subsystems to be installed
5. remove [keywords] [names]	Select subsystems to be removed
6. keep [keywords] [names]	Do not install or remove these subsystems
7. step [keywords] [names]	Enter interactive mode for install/remove/keep
8. versions [args]	Get information about installed software
9. help [topic]	Get help in general or on a specific word
10. admin	Go to the Administrative Commands Menu
11. quit	Terminate software installation

```
Inst> list                                Display the subsystems available for installation and the default
                                           installation selections made by inst.
```

(a message about reading the installation history database appears)

(a list of the products in the distribution and disk space checking output appears, followed by a list of subsystems with their selection status, installation status, and disk space usage information)

```
Inst> install *.man.*                       Request installation of all man subsystems.
Inst> keep showcase                         Request that new version of showcase not be installed.
Inst> remove eoe2.sw.ikc                   Request that the installed version of eoe2.sw.ikc be removed.
```

Inst> **list** Display subsystems and their status.
(a list of subsystems with their selection status, installation status, and disk space usage information appears)

Inst> **go** If the disk space summary shows that you have enough disk space, start the installation and/or removal of subsystems.
(messages about images being removed and installed appear, followed by a completion message)

Inst> **quit** Exit *inst* if there are no more software distributions; otherwise, follow the procedure for changing software distributions for your distribution type.
(messages that might include a message about changed configuration files appear)

Ready to restart the system. Restart? [y, n] **y**
 Start the boot up sequence.

(output from the boot up sequence appears, possibly including a message about changed configuration files)

login: **root** Log in as *root* if a changed configuration file message appeared; if no changed configuration file message appeared, installation is complete.

versions changed Display a list of the configuration files that have *.O* or *.N* versions.

diff /etc/passwd /etc/passwd.N Use any program that displays differences between two files to check to see what new features were added to */etc/passwd* (*/etc/passwd.N* is the new version).

vi /etc/passwd Use any editor to make changes to the no-suffix version. Where a *.N* file was created, these changes are likely to be new features from the new release.

diff /usr/etc/inetd.conf /usr/etc/inetd.conf.O Check to see what changes were made in the new version of */usr/etc/inetd.conf* (*/usr/etc/inetd.conf.O* is the old version).

vi /usr/etc/inetd.conf Make changes to */usr/etc/inetd.conf*. Where *.O* files were created, these files are likely to contain local customizations.

rm /etc/passwd.N /usr/inetd.conf.O Remove *.N* and *.O* files after updating the no-suffix versions. Installation is now complete.

Software Distributions

This chapter explains many of the details of software distributions including naming and structuring conventions; conventions that indicate required, recommended (default) and optional software; what's installed at the factory; and software distribution locations (CD-ROM, tape, and disk).

Software Distributions

This chapter introduces you to Silicon Graphics software distributions:

- Section 2.1, “Anatomy of a Catalog Item,” explains the contents of Silicon Graphics software distributions to help you understand the files and other data on the tapes and CDs you receive.
- The two types of software releases, Software Product Releases and Maintenance Releases, are discussed in Section 2.2, “Types of Software Releases.”
- Section 2.3, “Required and Default Subsystems,” explains “required” software and “default” software. These classifications help you decide what must be installed, what is suggested, and what is optional. It also describes in general terms what software is installed on your workstation when you receive it.
- Section 2.4, “Software Installed in the Factory,” explains what software is and isn’t installed on your workstation when you receive it, and how to find out exactly what’s installed on it.
- Finally, Section 2.5, “Software Distribution Sources,” explains that you can insert software release tapes and CDs into drives on any Silicon Graphics workstation on the network when you want to do an installation. Another alternative is to copy the software from tape or CD to a directory on disk and install it from there.

This information and the terminology introduced throughout this chapter are the foundation for understanding the software installation process and the terms used throughout this guide.

2.1 Anatomy of a Catalog Item

catalog item In order to reduce confusion later, we'll call the software products you buy from Silicon Graphics *catalog items*. All workstations and some hardware products include software as well. In this guide, we'll call this type of software a catalog item, too.

Figure 2-1 shows the Fortran 77 Compiler catalog item broken down hierarchically into components. When you install software, you'll work with components in the middle levels of the hierarchy. Beneath each box in Figure 2-1 is an example of that component in the Fortran 77 Compiler catalog item. The ellipses (...) are used to indicate that there may be additional components of the same type as the box to the left of the ellipses.

software distribution The software for a catalog item is distributed on one or more 1/4-inch cartridge tapes or CDs. The number of tapes or CDs is a function of the amount of software in the catalog item and the capacity of the media. Each tape or CD is called a *software distribution*.



Software distributions have an encoded format that can be decoded only by the programs *inst(1M)* and *distcp(1M)*. A software distribution can be installed by *inst*, copied from a tape into a directory by *distcp*, or copied from a CD into a directory by *cp(1)*. After a software distribution is copied into a directory, it still has the same encoded format as it had on tape or CD.

Most software distributions are not specific to particular models of IRIS workstations. They contain all versions of any files that are hardware specific. Sometimes when a new model of workstation is introduced, software distributions are created that are specific to that model. In this case, the next release of all catalog items includes the files that are needed to support the new model of workstation.

product Each software distribution contains one or more *products*. Each product is a collection of files that can be installed onto your workstation. Products have short names that you use within *inst*. For instance, the name of the Fortran 77 Compiler product is *ftn*.

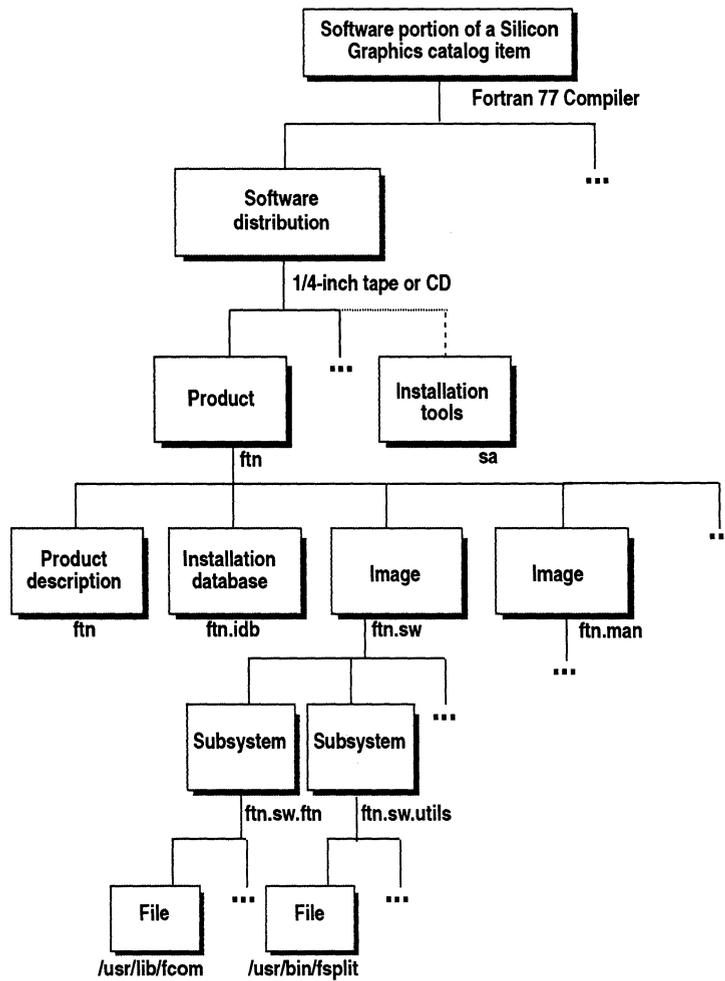


Figure 2-1 Software Components of a Catalog Item

Installation Tools	Some software distributions contain <i>Installation Tools</i> as well as products. Installation Tools are a set of files used during installation. These files are copied into the swap partition of your system disk and create an installation environment called the <i>miniroot</i> .
miniroot	
product description	Products have three types of components: a <i>product description</i> , an <i>installation database</i> , and two or more <i>images</i> . The product description contains information about the installation environment and requirements for the product. The installation database contains installation information for every file in the product. The images are archives of the files that will be installed on your workstation.
installation database	
image	
	In a software distribution, each of these components (product description, installation database, and images) is a single file. The name of the product description file is <i><product></i> (<i>ftn</i> , for example), the name of the installation database is <i><product>.idb</i> (<i>ftn.idb</i> , for example), and the names of the images are <i><product>.<image></i> (<i>ftn.sw</i> and <i>ftn.man</i> , for example). By convention, the software and manual pages in a product are always divided into different images to give users more control over what is installed.
subsystem	The files in images are subdivided into groups called <i>subsystems</i> . When we talk about subsystems, we use a fully qualified name of the form: <i><product>.<image>.<subsystem></i> . Example subsystems for the <i>ftn</i> product are <i>ftn.sw.ftn</i> and <i>ftn.sw.utils</i> . You do not install files individually with <i>inst</i> ; you install groups of files (subsystems). For example, if you want to install the file <i>/usr/bin/fsplit</i> , you install it by installing the subsystem <i>ftn.sw.utils</i> .

2.2 Types of Software Releases

Section 2.1 explains that all Silicon Graphics catalog items that include software are made up of one or more software distributions. These software distributions are either *Software Product Releases* or *Maintenance Releases*. Software Product Releases and Maintenance Releases have characteristics that are important during the installation process.

2.2.1 Software Product Releases

Software Product Release

A Software Product Release usually contains all of the files in a catalog item. (Exceptions are cases where all the files won't fit on a single software distribution (tape) or more than one catalog item is on a software distribution (CD)). The characteristics of Software Product Releases are:

- Since a Software Product Release contains all of the files in a catalog item, you don't have to install previous versions of the catalog item in order to have all of its files.
- When you install Software Product Releases, files from previous versions of the Software Product Release are automatically removed first. The only exception to this practice is that configuration files are saved if they contain local modifications.
- Software Product Releases usually contain all versions of hardware-specific files. Installation of the proper version is done automatically. Sometimes when a new model of workstation is introduced, a Maintenance Release that can be used with a limited number of platforms, including the new workstation, is released.
- Software Product Releases may have prerequisites that require them to be installed in a particular order. The *Release Notes* for each catalog item list these requirements, if there are any. *inst* will tell you what these requirements are if you attempt to install software without meeting the prerequisite requirements.
- Compatibility problems between particular versions of different Software Product Releases are noted in the *Release Notes* for each catalog item. *inst* will not install incompatible versions of subsystems.
- *Release Notes* for a catalog item are always included in the Software Product Release as a subsystem that you can install. A printed copy of the *Release Notes* is shipped with some catalog items. CD software distributions may also contain a copy of the *Release Notes* that you can view on-line before you install any subsystems. Instructions for viewing these *Release Notes* appear in the pamphlet in the CD's jewel case.

2.2.2 Maintenance Releases

Maintenance Release

Bug fixes and support for new hardware are sometimes released without re-releasing all of the files in a catalog item. Instead, a Maintenance Release is created. Subsystems in Maintenance Releases have names that are similar to the subsystem names from Software Product Release, but each product name begins with the word *maint*. Maintenance Releases have these characteristics:

- Maintenance Releases apply to particular Software Product Releases. Maintenance Release *x.y.z* is a Maintenance Release for the *x.y* release.
- Product names for Maintenance Releases always begin with “maint”. Image names are created by taking original product names and image names and joining them with an underscore (_). Subsystem names remain the same. For example, files from *eoel.sw.unix* that are put into a Maintenance Release are put in a subsystem named *maint_eoel.eoel_sw.unix*.
- Maintenance Releases are always cumulative. This means that the *x.y.2* Maintenance Release contains all of the bug fixes included in the *x.y.1* Maintenance Release.
- Maintenance Releases are sometimes hardware specific. This means that they contain files for a subset of Silicon Graphics workstation configurations rather than containing files for all workstation configurations.
- *Release Notes* for a Maintenance Release are often included in the Maintenance Release as a subsystem that you can install. A printed copy of the *Release Notes* is shipped with some Maintenance Releases. CD software distributions may also contain *Release Notes* that you can view on-line before you install any subsystems. Instructions for viewing these *Release Notes* appear in the pamphlet in the CD's jewel case.

For information about the special characteristics of Maintenance Release products during installation, see Section 9.3, “Installing a Maintenance Release.”

2.3 Required and Default Subsystems

Some subsystems are classified as *default* subsystems. Some default subsystems are also classified as *required* subsystems to assist you in selecting subsystems to be installed.

required subsystems Required subsystems are critical to the operation of your workstation. Without them, IRIX will not boot up. You cannot exit *inst* if it detects that one of these subsystems is available for installation, but is not installed.

default subsystems  Default subsystems are suggested for installation. The basic functionality of the product is contained in these subsystems. Where disk space is limited, the default subsystems serve as a guideline for users who are not yet sure which subsystems they need. You may find that you do not need some of the default subsystems and that you require some of the “other” subsystems for your work. Default subsystems can be installed or not depending on your needs.

When you use *inst*, you can request that a list of subsystems be displayed (more about this in Chapter 5). In these lists, default subsystems are marked with the character * and required subsystems are marked with the character +.

inst usually makes an initial guess about what subsystems you want to install. Required subsystems are always selected for installation during this initial guess, and default subsystems are selected unless you have prevented their installation in the past. This algorithm is explained fully in Section 5.1, “Overview of Using *inst*.” It is designed so that most users can install a new product or update already installed software with a minimum amount of selection, and still get a set of subsystems that is likely to meet their needs.

2.4 Software Installed in the Factory



Workstations are shipped with some subsystems from the *ee1*, *ee2*, *motif_ee*, and other standard (no cost) products installed. The *ee1* and *ee2* products contain basic operating system software, utilities, and window system software. Extra-cost software options such as the Network File System (NFS) and compilers are not installed on your workstation in the factory.

You can install additional software from *ee1*, *ee2*, *motif_ee* and software options using the basic installation procedure in Chapters 4, 5, and 6. You can remove any of the software that came on your workstation except required subsystems if you do not need it. The information in Chapters 4, 5, and 6 applies to removing software as well as installing it.

To find out what software is installed on your workstation when you receive it or at any other time, use the program *versions(1M)*:

```
% /usr/sbin/versions
```

The output of *versions* contains one line for every product, image, and subsystem installed on your workstation. Section 10.6, "versions Output," explains *versions* output in detail.

2.5 Software Distribution Sources

software *inst* reads the software to be installed from a *software distribution source*.
distribution source When a software distribution CD is inserted in a CD-ROM drive and mounted, it becomes a software distribution source. Similarly, when a software distribution tape is inserted into a tape drive on your workstation or a remote workstation, you have created a software distribution source.

distribution directory Another variant of software distribution is a *distribution directory*. Distribution directories are created by copying software distributions from tape to an IRIX directory using a program called *distcp(1M)* or by copying from a CD to a directory with *cp(1)*.
distcp

Distribution directories have a format similar to a distribution on tape or CD: product descriptions, installation databases, and images. Several tapes and/or CDs can be copied into a single directory. Creating distribution directories with *distcp* and *cp* is described in Section 7.25, "Creating Software Distribution Directories."



Figure 3-1 gives a pictorial description of the six possible software distribution sources: local tape, local CD-ROM, local distribution directory, remote tape, remote CD-ROM, and remote distribution directory. A distribution source is a *local distribution source* if the tape drive, CD-ROM drive, or distribution directory is on the same workstation that you plan to install software on. When you use a tape drive, CD-ROM drive, or distribution directory on another workstation that you access over a network, you are using a *remote distribution source*.

local distribution source

remote distribution source

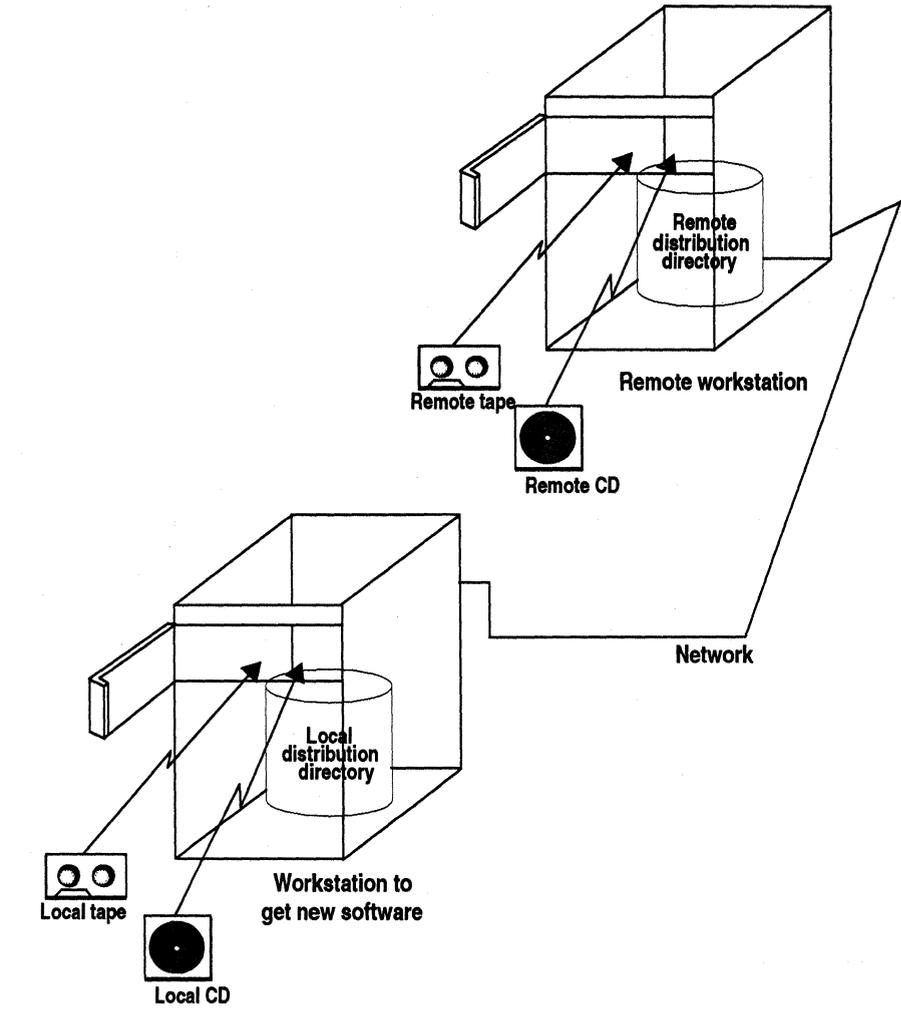


Figure 2-2 Software Distribution Sources

Site Preparation

This chapter explains set up tasks that enable remote installations. These tasks, enabling BOOTP forwarding, enabling TFTP access, and configuring a user ID for installation, are usually performed by a system administrator.

Site Preparation

A few site preparation tasks must be done prior to software installation when:

- Remote installations are planned and *bootp*(1M), and/or *tftp*(1C) security is enabled.
- Remote installations are planned and a *guest* account without a password on the remote workstation is not available (in other words, *rsh*(1C) security is implemented).



These preparations are often done by a System Administrator. However, depending on your circumstances, you might be the person who has to do the preparation.

Section 3.1, “Enabling BOOTP Forwarding on Routers,” explains the network software modifications which are required for remote installations at sites where *bootp* forwarding is disabled and the Miniroot Installation method is used. *bootp* forwarding is disabled by default on new workstations.

Section 3.2, “Enabling TFTP Access on Remote Workstations,” explains the network software modifications which are required for remote installations at sites where *tftp* security is enabled. *tftp* security is enabled by default on new workstations.

Section 3.3, “Configuring an Installation User ID,” explains your options and how to implement them when a *guest* account without a password is not available on a workstation used for remote installations.

3.1 Enabling BOOTP Forwarding on Routers

All routers (workstations or other devices with multiple network connections) between your workstation and a remote workstation that has the software distribution you plan to use must be modified to enable *bootp* forwarding. *inst* uses the Internet Bootstrap Protocol (BOOTP) to obtain IP addresses, but the default configuration of *bootp(1M)* in */usr/etc/inetd.conf* prevents this.

Step 1 below describes how to identify routers. Step 2 describes how to check to see if */usr/etc/inetd.conf* has already been modified to enable *bootp* forwarding on Silicon Graphics workstations. Steps 3 and 4 describe how to make the modifications on Silicon Graphics workstations. The procedure for making modifications to other types of routers may be different. You may want to ask a System Administrator or the owners of the routers to make the modifications for you.

1. Find out the names of the routers with the command:

```
% /usr/etc/ping -R -c 1 <server>
```

The *ping* output has a section that begins with **RR:**. It shows the route of a packet from your workstation to *<server>* and back to your workstation. Each of the workstations listed, other than *<server>* and your workstation, is a router.

2. Check the *bootp* line in */usr/etc/inetd.conf* on each router. The *bootp* line in */usr/etc/inetd.conf* looks like this by default:

```
bootp  dgram  udp    wait   root   /usr/etc/bootp      bootp
```

After the line has been changed ("*-f*" added), it should look like this:

```
bootp  dgram  udp    wait   root   /usr/etc/bootp      bootp -f
```

3. If the file has not been changed, edit */usr/etc/inetd.conf* to add "*-f*" as shown above. To simplify changing the file back to its original state, you may want to copy the original line, comment out one copy and change the other.
4. Give this command as superuser to make the change take effect:

```
# /etc/killall -v -HUP inetd
```

When the remote system is no longer needed for software installation, you can return the */usr/etc/inetd.conf* file to its original state if desired and give the *killall(1M)* command again to make that change take effect.

3.2 Enabling TFTP Access on Remote Workstations

The remote workstation that has the software distribution directory, tape drive, or CD-ROM drive you plan to use must be modified to allow *tftp* access. *inst* uses Trivial File Transfer Protocol (TFTP) in its transfer of files from remote workstations, but the default configuration of *tftpd(1M)* in */usr/etc/inetd.conf* doesn't allow this transfer.

Step 1 below describes how to check to see if */usr/etc/inetd.conf* has already been modified to allow *tftp* access. Steps 2 through 5 describe how to make the modifications. You may want to ask a System Administrator or the owner of the remote workstation to make the modifications for you.

1. Check the *tftp* line in */usr/etc/inetd.conf* on the remote workstation. The *tftp* line in */usr/etc/inetd.conf* looks like this by default:

```
tftp dgram udp wait guest /usr/etc/tftpd tftpd -s /usr/local/boot
```

After the line has been changed ("*-s /usr/local/boot*" removed), it should look like this:

```
tftp dgram udp wait guest /usr/etc/tftpd tftpd
```



This change allows *tftpd* access to all publicly readable directories. The line might also have been modified as described in Step 3 and 4 below.

2. If the file has not been changed, edit */usr/etc/inetd.conf* to remove "*-s /usr/local/boot*" as shown above. To simplify changing the file back to its original, secure state, you may want to copy the original line, comment out one copy and change the other.
3. If you want, you can limit remote access to just the distribution directory, CD-ROM distribution, or tape drive. Edit the *tftp* line in */usr/etc/inetd.conf* again and add a directory at the end of the line as shown below. The first line below is for a distribution directory, the second line is for a CD-ROM distribution, and the third is for tape.

```
tftp dgram udp wait guest /usr/etc/tftpd tftpd -s /usr/local/boot <distdir>
```

```
tftp dgram udp wait guest /usr/etc/tftpd tftpd -s /usr/local/boot <CDdir>/dist
```

```
tftp dgram udp wait guest /usr/etc/tftpd tftpd -s /usr/local/boot /dev
```

4. If a user ID other than *guest* will be used for installation (see Section 3.3), the "guest" on the *ftp* line should be replaced with the user ID that will be used.
5. Give this command as superuser to make any changes to */usr/etc/inetd.conf* take effect:

```
# /etc/killall -v -HUP inetd
```

When the remote system is no longer needed for software installation, you can return the */usr/etc/inetd.conf* file to its original state if desired and give the *killall(1M)* command again to make that change take effect.

3.3 Configuring an Installation User ID

When you are doing an installation from a remote distribution source, *inst* uses the user ID *guest* (with no password) on the remote workstation by default. If a *guest* user ID without a password is available on the remote workstation, then that user ID can be used without modification.

If no *guest* account exists on the remote workstation or the *guest* account has a password (typically this would be done to limit access to the remote workstation by *rsh*), you must provide an alternate means for *inst* to access the remote workstation. There are three alternatives:

- Remove the password from *guest* while installations are taking place.
- Use a different user ID on the remote workstation that does not have a password. This user ID is specified with the *inst -f* flag (see Section 7.5, "Specifying the Distribution Source on the Command Line") or with the *from* command within *inst* (see Section 10.2, "from Arguments").
- Use a user ID with a password on the remote workstation and special entries in its *.rhosts* file on the remote workstation. An entry needs to be made for each workstation that uses the remote workstation for installation. Each entry contains the name of the local workstation and the name of the user ID to be used on the remote workstation. For example, the file */usr/people/instuser/.rhosts* on the workstation "bigserver" might contain the lines:

```
joesbox.engr.xxx.com  instuser
lab1.engr.xxx.com    instuser
```

When installing new software on "joesbox" or "lab1", you would give one of these two commands, depending on the circumstances:

```
# /usr/sbin/inst -f instuser@bigserver:<path>
```

```
Inst> from instuser@bigserver:<path>
```

where *<path>* is the device or directory that has the software distribution. Sections 7.5 and 10.2 describe *inst -f* and *from*, respectively. */usr/people/instuser/.rhosts* must have the correct owner and permissions for this to work. See the *hosts.equiv(4)* manual page for details.

No matter what user ID you choose, it must have read permission for the software distribution source (the tape drive, the directory where the CD-ROM drive is mounted, or the distribution directory).

Bringing Up *inst*

This chapter is the first of three that give detailed directions for using inst. Deciding where to install software from, choosing Miniroot Installation or IRIX Installation, preparing for remote installation, and invoking inst are covered in this chapter.

Bringing Up *inst*

This chapter is the first of three that describe the steps you perform to install software using *inst*. In this chapter, the steps from preparing your workstation to seeing the first *inst* menu are presented. This chapter assumes that the site preparations covered in Chapter 3, "Site Preparation," have already been performed, if necessary.

Section 4.1, "Overview of Bringing Up *inst*," gives a high-level description of the procedures in this chapter.

Sections 4.2 through 4.6 each explain a preparation step that is done prior to most installation sessions:

- 4.2, "Identifying Your Software Distribution Source"
- 4.3, "Choosing an Installation Method: Miniroot or IRIX"
- 4.4, "Deciding the Installation Order of Software Distributions"
- 4.5, "Backing Up Your Workstation"
- 4.6, "Preparing for Installing from a Remote Distribution Source"

Six subsections of Section 4.7, "Invoking *inst*," give the most common procedures for invoking *inst*. Depending on the software distribution source and installation method you choose, you use one of these sections:

- 4.7.1, "Miniroot Installation from Local CD-ROM"
- 4.7.2, "Miniroot Installation from Local Tape"
- 4.7.3, "Miniroot Installation from Remote CD-ROM"
- 4.7.4, "Miniroot Installation from Remote Tape"
- 4.7.5, "Miniroot Installation from a Remote Distribution Directory"

- 4.7.6, "IRIX Installation from Local or Remote CD-ROM, Tape, or Distribution Directory"

Additional Miniroot Installation procedures are covered in Section 7.1, "Loading the Miniroot from the Command Monitor."

4.1 Overview of Bringing Up *inst*

Figure 4-1 is a flowchart of the steps you take to prepare for running *inst*. This section briefly describes these steps in order to introduce you to the steps and to define some of the key terms and concepts in this chapter.

Installation begins by identifying the tapes, CDs, or distribution directories that contain the software you plan to install and the tape drive or CD-ROM drive (if any) you will use. With this information, you can figure out which of the six possible types of software distribution sources you will be using for your installation.

installation method You must choose one of two *installation methods* prior to using *inst*. The two methods differ in how you invoke the *inst* program, and in what other tasks can be performed on your workstation while you are doing software installation. Characteristics of the software you want to install can require you to use one installation method rather than the other. The two methods are called *Miniroot Installation* and *IRIX Installation*.

Miniroot Installation
IRIX Installation

If you have software on more than one tape or CD to install, the next step is to figure out the order in which you are going to install them.



Before beginning an installation, you should back up your workstation. Backing up your workstation is a safety precaution rather than a required step since you do not need this backup in order to complete your installation. When you install *ee1* and *ee2*, it is strongly recommended that you back up your workstation in case any errors are made or you decide to abort the installation.

PROM Monitor

The rest of the preparation process depends on which installation method you have chosen. If you've chosen IRIX Installation, you invoke *inst* from the shell. If you've chosen Miniroot Installation, you shut down your workstation and give a few commands at the *PROM Monitor* level in order to invoke *inst*.

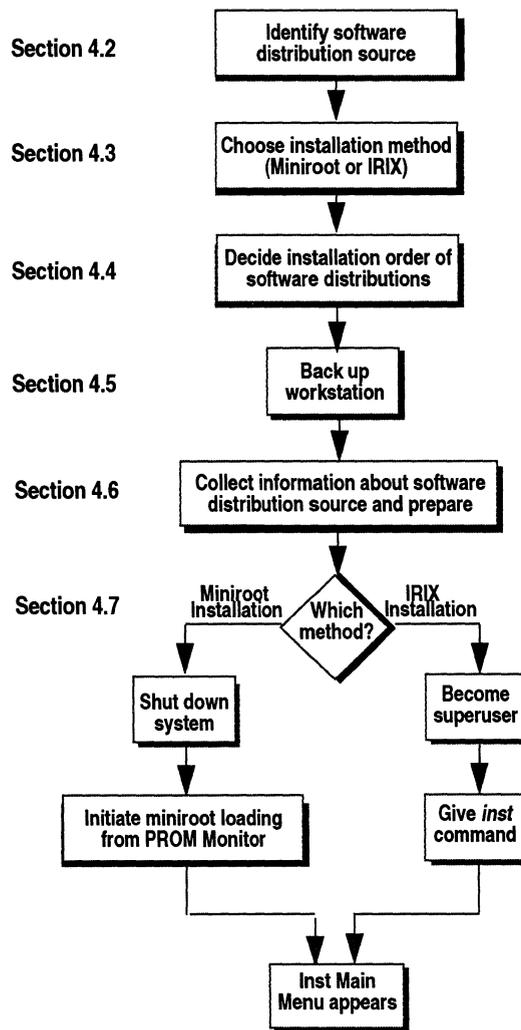


Figure 4-1 Bringing Up *inst* Flowchart

Command Monitor

The PROM Monitor is a command interpreter that resides in firmware on your system. It executes a limited number of commands and can be changed or updated only by changing PROM integrated circuits in your workstation. It displays menus, has interactive prompts, and also has a command mode called the Command Monitor which is similar to an IRIX shell. Different Silicon Graphics workstations may have different Command Monitor interfaces.

load the miniroot

The commands you give while in the PROM Monitor *load the miniroot* and automatically invoke *inst*. The *miniroot* is one of the components of Installation Tools and contains an IRIX kernel, *inst*, and a few other tools and files. A standalone program called *sash* (also in the Installation Tools) copies (loads) the miniroot into a portion of the swap partition of a disk on your workstation.

After you load the miniroot, your workstation is running this very restricted version of IRIX. You cannot perform any other tasks on your workstation, and your workstation operates as if it has an ASCII terminal even if it has graphics. This restriction preserves the integrity of the operating system while you are updating it.

You've completed your preparation for *inst* when the Inst Main Menu (Figure 4-2 or Figure 4-3) appears on your workstation.

4.2 Identifying Your Software Distribution Source

Section 2.5, "Software Distribution Sources," explains the six possible software distribution sources. Follow these simple steps to identify your software distribution source:

1. Identify the software distributions that you want to install. Your choices are: one or more 1/4-inch tapes, one or more CDs, or one or more distribution directories.
2. If you are using tapes or CDs, identify the tape drive or CD-ROM drive that you will be using for installation.
3. Use Table 4-1 to identify your software distribution source.

If you use:	Your software distribution source is:
Software distribution tape(s) and a tape drive on your workstation	Local tape
Software distribution tape(s) and a tape drive on another workstation	Remote tape
Software distribution(s) on CD(s) and a CD-ROM drive on your workstation	Local CD-ROM
Software distribution(s) on CD(s) and a CD-ROM drive on another workstation	Remote CD-ROM
A distribution directory on your workstation	Local distribution directory
A distribution directory on another workstation	Remote distribution directory

Table 4-1 Software Distribution Source Identification

4.3 Choosing an Installation Method: Miniroot or IRIX

Section 4.1, "Overview of Bringing Up *inst*," described the two installation methods, Miniroot Installation and IRIX Installation. Some subsystems must be installed using Miniroot Installation and others can be installed using either method. As a rule of thumb, products that require kernel reconfiguration or contain daemons have at least one subsystem that requires Miniroot Installation.

There are two ways to find out if the subsystems you want to install require Miniroot Installation:

- Read the *Release Notes* for the software products you plan to install. *Release Notes* list all of the subsystems in their products that require Miniroot Installation.

- Invoke *inst* using the IRIX Installation method. Give the `list` command and check to see if the subsystems you want to install are marked with `@` (see Section 10.5, “`list` Output”). If the subsystem has an `@`, it requires Miniroot Installation. If it doesn’t have an `@`, it can be installed using IRIX Installation.

inst refuses to install subsystems that require Miniroot Installation if you have invoked *inst* from IRIX. You get an error message when you give the `go` command.

4.4 Deciding the Installation Order of Software Distributions

When you want to install software, you are likely to have more than one software distribution to install. In other words, you have several tapes, CDs, or distribution directories. *inst* takes care of installing all of the products in a single distribution in the correct order. If you have more than one distribution, they must be ordered correctly, because some products require that other products be installed first. There are several steps to determining the installation order of your software distributions.



1. If you have tapes or CDs with sequence numbers on their labels, you can use the sequence numbers to put the tapes or CDs in order. Guidelines for some situations you may encounter are:
 - If any of the tapes or CDs have two sequence numbers, that tape or CD is used twice during your installation. If you find no intervening sequence numbers, you insert the tape or CD just once.
 - If you have two or more tapes or CDs with the same sequence number, the order of those tapes and CDs relative to each other doesn’t matter. For example, you have four CDs with sequence numbers 400, 500, 600, and 600. 400 would be the first CD and 500 would be the second. The order of the two CDs labeled 600 doesn’t matter as long as they are the last two CDs.
2. If you are installing from several distribution directories, first check to see what products are in each directory (see Section 8.2.6, “Checking Distribution Directories and CDs”). Then, order the distribution directories so that Installation Tools are first, Software Product Releases are second, and Maintenance Releases are last. Consider asking the person who created the distribution directories for guidance, too.

3. If you are using the Miniroot Installation method, check to make sure that your first tape, CD, or distribution directory contains Installation Tools. If it doesn't, you need to locate a software distribution with Installation Tools before you can begin your installation.

4.5 Backing Up Your Workstation



Although backing up your workstation is not absolutely required prior to beginning a software installation, you are strongly encouraged to make a backup. Having a backup enables you to recover old files if you need to for any reason. If you have files on your workstation that are irreplaceable, you should create a backup and verify that backup before proceeding with installation.

The *Personal System Administration Guide* describes general backup procedures and using System Manager to perform backups. Other programs you can use to make backups are *Backup(1)*, *bru(1)*, *cpio(1)*, and *tar(1)*. See their manual pages for more information.

Rather than backing up all of the files on your workstation, you may want to consider backing up a subset of the files or various types of files on different tapes. The three types of files (or subsets) you might want to consider are:

- User files

user files

User files are the files that you and other users create or copy to the workstation. Any file on your workstation that was not put there during the software installation process is a user file.

- Configuration files

Configuration files are installed during software installation but are likely to be modified by the System Manager or with IRIX commands after installation to include information unique to your workstation or your site. You do not lose this unique information when you install a new release of software. However, if you decide after installing a new release of software that you would like to go back to your earlier software release, a backup of configuration files created when you were running the earlier release is helpful.

- Other installed files

Most of the files installed by *inst* are not configuration files. If you still have access to the software distributions they came from, backing them up at this point may be unnecessary, because the software can be reinstalled if needed for recovery.

If you would like to back up modified configuration files only, you can identify the configuration files you have modified by giving the command:

```
# /usr/sbin/versions -c -m
```

One way to create a backup of these files on your workstation's tape drive is:

```
# /usr/sbin/versions -c -m | tar cv -
```

Later, if you need these files, you can extract one or more specific files with this command:

```
# /bin/tar xv <files>
```

The *<files>* will be read into their original locations. You can extract all of the files with this command:

```
# /bin/tar xv
```

4.6 Preparing for Installing from a Remote Distribution Source

When you are installing software from a remote distribution source, follow these steps to gather information you need, verify the connection from your workstation to the remote workstation, and start up *cdinstmgr*(1) if applicable:

1. If you are unsure whether the remote workstation you are planning to use has been modified to allow *tftp*(1C) access, see Section 3.2, "Enabling TFTP Access on Remote Workstations."
2. If you are unsure whether routers between your workstation and the remote workstation have been modified to enable *bootp*(1M) forwarding, see Section 3.1, "Enabling BOOTP Forwarding on Routers."

3. Get the name of the remote workstation whose CD-ROM drive, tape drive, or distribution directory you are using by giving this command on the remote workstation:

```
% /usr/bsd/hostname
```

The name that is printed is the value of *<server>*. If the remote workstation is in a different domain than your workstation, you may have to qualify the remote workstation name by adding “.*<domain>*” to *<server>*. This name is case sensitive, so be sure to note the use of capital letters.

4. Determine the value of *<user>*, the user ID to be used on the remote workstation during installation. If an account other than *guest* has been set up on the remote workstation for security reasons (discussed in Section 3.3), then the user ID for that account is the value of *<user>*. Otherwise, the value of *<user>* is “*guest*”.
5. Get the Internet Protocol (IP) address of the remote workstation using the *ping* command:

```
% /usr/etc/ping -q -f -s 2048 -c 100 <server>
```

```
PING <server> (<IPaddress>): 2048 data bytes
```

```
----<server> PING Statistics----
```

```
100 packets transmitted, 100 packets received, 0% packet loss  
round-trip (ms)  min/avg/max = 0/2/7
```

<server> is the name of the remote workstation. *<IPaddress>* is the string of four numbers separated by periods in the first line of output. If your workstation isn't running IRIX, give this command from another workstation and write the IP address down since you will be prompted for it later.

If you don't get a response similar to this example, you may have a problem with the network connection. You should resolve the problem before continuing with your installation by getting help from your Network Administrator and using the information in Section 8.2.2.

6. If IRIX is running on your workstation, do a simple check of the network connection and get the IP address of your workstation with this command:

```
% /usr/bsd/rsh <server> -l <user> '/usr/etc/ping <hostname>'
```

<hostname> is the name of your workstation. The response you get will be similar to the *ping* output from the previous step. The IP address you

get is the value of *<localIPAddress>*. If you get an error, resolve the problem (see the previous step) before continuing.

7. The remainder of this procedure applies to remote CD-ROM only. If you are using remote tape or a remote distribution directory, stop here.
8. On the remote workstation (*<server>*), start the program *cdinstmgr*:

```
% /usr/sbin/cdinstmgr
```

cdinstmgr manages the mounting and unmounting of CDs on remote workstations. It also prevents other users from ejecting your CD during your installation and informs you of error conditions such as the CD-ROM drive being in use by others. You terminate *cdinstmgr* when you finish your installation session.

9. Follow the directions provided by *cdinstmgr* as it prompts you for the name of your workstation (*<hostname>*) and guides you through the process of inserting the first CD into the caddy and the caddy into the CD-ROM drive. Be sure to insert the CD with the label up. (See Section 4.4, "Deciding the Installation Order of Software Distributions," if you don't know which CD to insert first.) If *cdromd*(1M) is not already running on the remote workstation, you must supply the superuser password for the remote workstation to *cdinstmgr*.
10. When you see the message below, note the value of *<CDdir>*, the mount point directory, since you will need it later.

CD on *<CDdir>* for host *<hostname>*: type the word "done" when you are finished with this CD, "quit" if you are completely done:

You will respond to this prompt after you have finished using this CD.

11. Make sure that you can access the CD from your workstation by giving this command from your workstation:

```
% /usr/bsd/rsh <server> -l <user> 'ls <CDdir>/dist'
```

If you get an error rather than seeing a list of files whose names begin with product names, you should diagnose and solve the problem before continuing. See Sections 8.2.2, 8.2.5, and 8.2.6.

4.7 Invoking *inst*

The procedure for invoking *inst* depends on what distribution source you are using and the installation method you have chosen. Section 4.2, "Identifying Your Software Distribution Source," describes the six possible distribution sources: local tape, local CD-ROM, local distribution directory, remote tape, remote CD-ROM and remote distribution directory. Choosing an installation method (Miniroot Installation or IRIX Installation) is covered in Section 4.3, "Choosing an Installation Method: Miniroot or IRIX."

The next six sections describe the procedure for bringing up *inst* for one or more of the eleven possible combinations of distribution source and installation method. Use the section for your situation only and go on to Chapter 5, "Using *inst*," when you've completed the steps in your section. If you experience problems, Section 8.3, "Problems During Preparation for Running *inst*," and Section 8.6, "Problems without Error Messages," discuss the problems that you might encounter during this phase of installation.

4.7.1 Miniroot Installation from Local CD-ROM

This section contains the procedure for loading the miniroot and invoking *inst* using local CD-ROM as the software distribution source.

1. Make sure that the power is turned on. First, turn on the monitor and any peripherals that have their own On/Off switches, and then turn on the main unit.
2. Determine your workstation's CPU type (*<cpu>*) using one of the commands in Section 7.2, "Getting the CPU Type of a Workstation."
3. If IRIX is running, shut the system down in one of the following ways:
 - From the System menu choose "System Shutdown".
 - From a shell, become the superuser and bring the system down by typing:

```
% /bin/su -  
Password:  
# /etc/shutdown
```

4. If your workstation's CPU type is IP12 or IP17, skip to Step 11.
5. If your workstation's CPU type is IP19, IP20, or IP22, skip to Step 18.
6. Your workstation's CPU type is IP5, IP6, IP7, or IP9, so you see this menu or a similar one:

System Maintenance Menu

- 1) Start System
- 2) Install System Software
- 3) Run Diagnostics
- 4) Recover System
- 5) Enter Command Monitor

Option?

Choose Enter Command Monitor by pressing:

5

You may or may not need to press **<Enter>**.

7. Get the controller (*<cntrl>*) and unit (*<unit>*) numbers for your CD-ROM drive using the procedure in Section 7.3, "Getting Controller and Unit Numbers for CD-ROM Drives."

8. Insert the first CD into the CD caddy with the label side up. Insert the caddy into the CD-ROM drive on your workstation. (See Section 4.4, "Deciding the Installation Order of Software Distributions," if you don't know which CD to insert first.)

9. Give this command to copy the miniroot and invoke *inst*:

```
>> dksc (<cntl>, <unit>, 8) sash.<cpu> -m
```

Note that only one space character is used in the command; it follows <cpu>. A few numbers are printed and the screen is cleared. During the next few minutes, some rows of dots appear.

10. Skip to Step 24.

11. When you see this message on your IP12 or IP17 workstation:

```
Okay to power off the system now.
```

```
Press any key to restart.
```

```
press any key, for example:
```

```
<Enter>
```

12. When you see the message:

```
Starting up the system...
```

```
To perform system maintenance instead, press <Esc>.
```

```
then press:
```

```
<Esc>
```

within 5 seconds. If you do not press **<Esc>** quickly enough, the system reboots, and you have to log in and begin again at Step 3 in this section. This menu or a similar one appears:

```
System Maintenance Menu
```

- 1) Start System
- 2) Install System Software
- 3) Run Diagnostics
- 4) Recover System
- 5) Enter Command Monitor

```
Option?
```

13. Choose Install System Software by pressing:

2

You may or may not need to press **<Enter>**. This message appears:

```
Installing System Software...
```

```
Press <Esc> to return to the menu.
```

14. If both a tape drive and a CD-ROM drive are installed on your workstation, a message with a list of devices similar to this appears:

```
Select device for installation:
```

```
1 - tape <device> (<cntl>, <unit>)
```

```
2 - CDROM dksc (<cntl>, <unit>, 8)
```

```
which?
```

where *<device>* is a tape device. Respond with the number of the CD-ROM (2 in this example).

15. The following message or a similar message appears. Insert the CD into the caddy with the label up and the caddy into the CD-ROM drive, and press **<Enter>**:

```
Insert the installation tape, then press <enter>: <Enter>
```

(See Section 4.4, "Deciding the Installation Order of Software Distributions," if you don't know which CD to insert first.)

16. If both a tape drive and a CD-ROM drive are installed on your workstation, a message with a list of devices similar to this appears again:

```
Select device for installation:
```

```
1 - tape <device> (<cntl>, <unit>)
```

```
2 - CDROM dksc (<cntl>, <unit>, 8)
```

```
which?
```

Respond again with the number of the CD-ROM. During the next few minutes, the screen clears and some rows of dots appear as the miniroot is copied into the swap partition on your workstation.

17. Skip to Step 24.

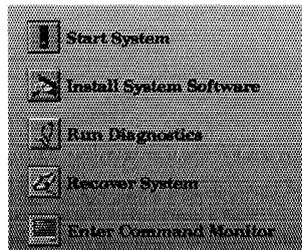
18. Click the *Restart* button or press **<Enter>** when you see this message on your IP19, IP20, or IP22 workstation:

Okay to power off the system now.
Press any key to restart.

This message appears:

Starting up the system...

19. Click the *Stop for Maintenance* button or press **<Esc>** immediately, since you have just five seconds before the message disappears and IRIX starts up. This menu or one similar to the menu in Step 12 appears:



20. Click the icon for *Install System Software* or type **2**. The menu is replaced by an *Install System Software* screen with four icons. (On an ASCII console, instead of four icons, you see some messages and this list of four items:

1) Remote Tape 2) Remote Directory 3) Local CD-ROM 4) Local Tape

These four items match the icons in the graphics version. Square brackets around an item indicate that it is the current selection. In the list of CD-ROM drive(s), one of them has an * next to it; this is the selected CD-ROM drive.)

21. Click the icon for *Local CD-ROM* or type **3**. On the screen you should see a line like this:

Local SCSI CD-ROM drive <n>

where <n> is the unit number of the CD-ROM drive.

22. Click the *Install* button or press **<Enter>**. This message appears:

Insert the installation CD-ROM now.

Insert a CD with Installation Tools into the caddy with the label up and the caddy into the CD-ROM drive if you haven't done so already.

23. Click the *Continue* button or press **<Enter>**. This message appears briefly:

Obtaining installation tools

This message or a similar one is shown:

Copying installation tools to disk

as the miniroot is copied to the swap partition on your workstation. Copying the miniroot takes many minutes. The status bar or dots indicate the progress of the copy.

24. The output in Figure 4-2 is displayed as *inst* is invoked automatically. *<version>* matches the last few digits of the release number of the software you are trying to install. *<longversion>* is an integer whose value doesn't matter. *<date>* should be the current date and time. *<root_device>* is the device pathname of your root file system. *<source>* is the distribution source. Its value is */CDROM/dist*.



If the date is off by more than a few minutes, reset the date with this command:

```
Inst> admin date <mmdhmmyy>
```

<mmdhmmyy> is described in the *date* discussion in Section 10.1, "Commands."

25. If you do not plan to install any of the products on the CD that contains the Installation Tools, remove the CD from the CD-ROM drive now by pressing the Eject button on the CD-ROM drive for two seconds. Replace the CD with the next CD you plan to install (label side up) and re-insert the caddy into the CD-ROM drive. It is not necessary to give the *from* command.

Go on to Chapter 5.

IRIX Release <version> <cpu> Version <longversion> System V

ipg0: missing
enp0: missing
fxp0: missing

(these missing messages are normal and do not indicate a problem; one line appears for each type of device supported by the kernel, but not used on your workstation)

Creating miniroot devices, please wait...
The system is coming up. Please wait.
The system is ready.

Current system date is <date>

Mounting file systems:

```
<root_device>      on /root
/root/dev/usr      on /root/usr
```

Default location of new software is <source>

If you are a first-time inst user, give the command "help beginner".

Inst Main Menu

- | | |
|-------------------------------|--|
| 1. from [source] | Specify location of software to be installed |
| 2. list [keywords] [names] | Display information about software subsystems |
| 3. go | Perform software installation and removal now |
| 4. install [keywords] [names] | Select subsystems to be installed |
| 5. remove [keywords] [names] | Select subsystems to be removed |
| 6. keep [keywords] [names] | Do not install or remove these subsystems |
| 7. step [keywords] [names] | Enter interactive mode for install/remove/keep |
| 8. versions [args] | Get information about installed software |
| 9. help [topic] | Get help in general or on a specific word |
| 10. admin | Go to the Administrative Commands Menu |
| 11. quit | Terminate software installation |

Inst>

Figure 4-2 Output from Loading the Miniroot

4.7.2 Miniroot Installation from Local Tape

This section contains the procedure for loading the miniroot and invoking *inst* using local tape as the software distribution source. If you have more than one tape drive on your workstation and your workstation's CPU type (see Step 4 below) is IP4, IP5, IP6, IP7, or IP9 the procedure below is not applicable to your workstation. Instead, use Section 7.1, "Loading the Miniroot from the Command Monitor."



1. Make sure that the power is turned on. First, turn on the monitor and any peripherals that have their own On/Off switches, and then turn on the main unit.
2. To prevent the possibility of problems later, retension your tape(s), and clean your tape drive heads, if possible, as described in Section 8.2.4, "Retensioning Tapes and Cleaning Tape Drives."
3. Insert the first tape into the tape drive on your workstation. (See Section 4.4, "Deciding the Installation Order of Software Distributions," if you don't know which tape to insert first.) Engage the tape heads by locking the tape in place. If you can't lock the tape, it isn't inserted correctly. Take the tape out, rotate it, and try again.
4. Determine your workstation's CPU type (*<cpu>*) using one of the commands in Section 7.2, "Getting the CPU Type of a Workstation."
5. If your workstation's CPU type is IP4, the procedure below is not applicable to your workstation. Section 7.1 contains the procedure you need for bringing up *inst*. Once you've completed that procedure, you can go on to Chapter 5.
6. If IRIX is running, shut the system down in one of the following ways:
 - From the System menu choose "System Shutdown".
 - From a shell, become the superuser and bring the system down by typing:

```
% /bin/su -  
Password:  
# /etc/shutdown
```
7. If your workstation's CPU type is IP19, IP20, or IP22, skip to Step 13.

8. Depending on the version of your PROM Monitor, you may see this message or something similar on your IP5, IP6, IP7, IP9, IP12, or IP17 workstation:

Okay to power off the system now.

Press any key to restart.

If you see this message, press any key, for example:

<Enter>

9. If you see the message:

Starting up the system...

To perform system maintenance instead, press **<Esc>**.

then press:

<Esc>

within 5 or 10 seconds (the amount of time you have depends on your PROM version). If you do not press **<Esc>** quickly enough, the system reboots, and you have to log in and begin again at Step 6 in this section.

10. When you see this menu or a similar one:

System Maintenance Menu

- 1) Start System
- 2) Install System Software
- 3) Run Diagnostics
- 4) Recover System
- 5) Enter Command Monitor

Option?

pick Install System Software:

Option? **2**

You may or may not need to press **<Enter>** after you press **2** on this menu.

11. The screen clears and you see the messages and prompt below or something similar. Press **<Enter>** at the prompt:

Installing System Software...

Press **<Esc>** to return to the menu.

Insert the installation tape, then press **<enter>**: **<Enter>**

During the next few minutes, a message and five to seven rows of dots appear as the miniroot is copied into the swap partition on your workstation.

12. Skip to Step 19.
13. Click the *Restart* button or press **<Enter>** when you see this message on your IP19, IP20, or IP22 workstation:

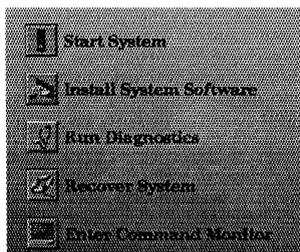
Okay to power off the system now.

Press any key to restart.

This message appears:

Starting up the system...

14. Click the *Stop for Maintenance* button or press **<Esc>** immediately, since you have just five seconds before the message disappears and IRIX starts up. This menu or one similar to the menu in Step 10 appears:



15. Click the icon for Install System Software or type **2**. The menu is replaced by an Install System Software screen with four icons. (On an ASCII console, instead of four icons, you see some messages and this list of four items:

1) Remote Tape 2) Remote Directory 3) Local CD-ROM 4) Local Tape

These four items match the icons in the graphics version. Square brackets around an item indicate that it is the current selection. In the list of tape drives, one has an * next to it; this is the selected tape drive.)

16. Click the icon for Local Tape or type **4**. On the screen you should see one or more lines like this:

```
Local SCSI Tape drive <n>
```

where <n> is the unit number of the tape drive.

17. Click the *Install* button or press **<Enter>**. This message appears:

```
Insert the installation tape now.
```

Insert a tape with Installation Tools if you haven't done so already.

18. Click the *Continue* button or press **<Enter>**. This message appears briefly:

```
Obtaining installation tools
```

This message or a similar one is shown:

```
Copying installation tools to disk
```

as the miniroot is copied to the swap partition on your workstation. Copying the miniroot takes many minutes. The status bar or dots indicate the progress of the copy.

19. The output in Figure 4-2 is displayed as *inst* is invoked automatically. <version> matches the last few digits of the release number of the software you are trying to install. <cpu> is the CPU type of your workstation. <longversion> is an integer whose value doesn't matter. <date> should be the current date and time. <root_device> is the device pathname of your root file system. <source> is the distribution source. In this case it is a tape device.



If the date is off by more than a few minutes, reset the date with this command:

```
Inst> admin date <mmddhhmmyy>
```

<mmddhhmmyy> is described in the *date* discussion in Section 10.1.

20. If you do not plan to install any of the products on the tape that contains the Installation Tools, remove the tape from the tape drive now and replace it with the next tape you plan to install. It is not necessary to give the *from* command.

Go on to Chapter 5.

4.7.3 Miniroot Installation from Remote CD-ROM

This section contains the procedure for loading the miniroot and invoking *inst* using remote CD-ROM as the software distribution source.

1. Make sure that the power is turned on. First, turn on the monitor and any peripherals that have their own On/Off switches, and then turn on the main unit.
2. Get the name of the remote workstation (*<server>*), the user ID to be used on the remote workstation (*<user>*), the IP address of the remote workstation (*<IPaddress>*), your workstation's IP address (*<localIPaddress>*), and the directory that the CD is mounted at on the remote workstation (*<CDdir>*) and perform other preparatory steps by following the procedure in Section 4.6, "Preparing for Installing from a Remote Distribution Source."
3. Determine your workstation's CPU type (*<cpu>*) using one of the commands in Section 7.2, "Getting the CPU Type of a Workstation."
4. If IRIX is running on your workstation, shut the system down in one of the following ways:
 - From the System menu choose "System Shutdown".
 - From a shell, become the superuser and bring the system down by typing:

```
% /bin/su -  
Password:  
# /etc/shutdown
```
5. If your workstation's CPU type is IP4, skip to Step 10.
6. If your workstation's CPU type is IP19, IP20, or IP22, skip to Step 22.
7. When you see this message on your IP5, IP6, IP7, IP9, IP12, or IP17 workstation:

Okay to power off the system now.

Press any key to restart.

press any key, for example:

<Enter>

8. When you see the message:

Starting up the system...

To perform system maintenance instead, press <Esc>.

press:

<Esc>

within 5 seconds. If you do not press <Esc> quickly enough, the system reboots, and you have to log in and begin again at Step 4 in this section.

9. This menu or a similar one appears:

System Maintenance Menu

- 1) Start System
- 2) Install System Software
- 3) Run Diagnostics
- 4) Recover System
- 5) Enter Command Monitor

Option?

Choose Enter Command Monitor by pressing:

5

You may or may not need to press <Enter>. You should now see the Command Monitor message and the prompt >>.

10. Get the value of the NVRAM variable *netaddr* by giving this command:

Command Monitor. Type "exit" to return to the menu.

```
>> printenv netaddr
```

11. Compare the IP address returned with <localIPaddress>. If they are not the same, change the value of *netaddr* to match <localIPaddress> with this command:

```
>> setenv netaddr <localIPaddress>
```

12. If your workstation's CPU type is IP6, IP12, or IP17, skip to Step 15.

13. Give two commands to load the miniroot and begin execution of *inst*. They are:

```
>> setenv tapedevice bootp(<server>:<CDdir>/dist/sa
```

```
>> boot -f $tapedevice(sash.<cpu>) --m
```

<cpu> should be one of IP4, IP5, IP7, or IP9. A message and some dots appear as the miniroot is copied into your workstation's swap partition.

14. Skip to Step 31.
15. If there is a tape drive on your IP6, IP12, or IP17 workstation, give this command to set the PROM variable *notape*:

```
>> setenv notape 1
```

16. Return to the System Maintenance Menu:

```
>> exit
```

17. Choose Install System Software by pressing:

```
2
```

You may or may not need to press **<Enter>**.

18. You will see the messages below or something similar. Enter **n** at the prompt:

```
Installing System Software...
```

```
Press <Esc> to return to the menu.
```

```
Are you using a remote tape? (y/n) n
```

19. The next prompt has this message or a similar one:

```
Enter the hostname of the server that has the installation software  
(e.g. hostname:directory):
```

Your response is:

```
<server>:<CDdir>/dist
```

20. During the next few minutes, you'll see this message,

```
Copying installation program to disk.
```

Some rows of dots appear as the miniroot is copied into the swap partition on your workstation.

21. Skip to Step 31.

22. Click the *Restart* button or press **<Enter>** when you see this message on your IP19, IP20, or IP22 workstation:

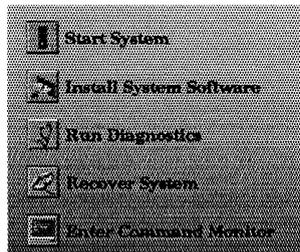
```
Okay to power off the system now.
```

```
Press any key to restart.
```

This message appears:

```
Starting up the system...
```

23. Click the *Stop for Maintenance* button or press **<Esc>** immediately, since you have just five seconds before the message disappears and IRIX starts up. This menu or one similar to the menu in Step 9 appears:



24. Click the icon for *Install System Software* or type **2**. The menu is replaced by an *Install System Software* screen with four icons. (On an ASCII console, instead of four icons, you see some messages and this list of four items:
- 1) Remote Tape 2) Remote Directory 3) Local CD-ROM 4) Local Tape
- These four items match the icons in the graphics version. Square brackets around an item indicate that it is the current selection.)
25. Click the *Remote Directory* icon or type **2**. This message and an entry field appear:
- Enter the name of the remote host:
26. Enter the name of the remote workstation that has the CD-ROM drive:
- `<server>`
27. Click the *Accept* button or press **<Enter>**. This message and an entry field appear:
- Enter the remote directory:
28. Enter this directory:
- `<CDir>/dist`
29. Click the *Accept* button or press **<Enter>**. A message like this appears:
- Remote directory `<CDir>/dist` from server `<server>`.

30. Click the *Install* button or press **<Enter>**. This message appears briefly:

```
Obtaining installation tools from <server>:<CDdir>/dist
```

This message or a similar one is shown:

```
Copying installation tools to disk
```

as the miniroot is copied to the swap partition on your workstation.

Copying the miniroot takes many minutes. The status bar or dots indicate the progress of the copy.

31. The output in Figure 4-2 is displayed as *inst* is invoked automatically. *<n>*, *<m>*, *<o>*, *<p>*, and *<longversion>* are integers whose values don't matter. *<version>* matches the last few digits of the release number of the software you are trying to install. *<date>* should be the current date and time. *<root_device>* is the device pathname of your root file system. *<source>* is the distribution source. Its value is *<server>:<CDdir>/dist*.



If the date is off by more than a few minutes, reset the date with this command:

```
Inst> admin date <mmddhhmmyy>
```

<mmddhhmmyy> is described in the date discussion in Section 10.1.

Go on to Chapter 5.

4.7.4 Miniroot Installation from Remote Tape

This section contains the procedure for loading the miniroot and invoking *inst* using remote tape as the software distribution source. If there is more than one tape drive on the remote workstation, the procedure below is not applicable to your workstation. Instead, use Section 7.1, "Loading the Miniroot from the Command Monitor."



1. Make sure that the power is turned on. First, turn on the monitor and any peripherals that have their own On/Off switches, and then turn on the main unit.
2. To prevent the possibility of problems later, retension your tape(s), and clean your tape drive heads, if possible, as described in Section 8.2.4.
3. Insert the first tape into tape drive on the remote workstation. (See Section 4.4, "Deciding the Installation Order of Software Distributions," if you don't know which tape to insert first.) Engage the tape heads by locking the tape in place. If you can't lock the tape, it isn't inserted correctly. Take the tape out, rotate it, and try again.
4. Get the name of the remote workstation (*<server>*), the user ID to be used on the remote workstation (*<user>*), the IP address of the remote workstation (*<IPaddress>*), and your workstation's IP address (*<localIPaddress>*), and perform other preparatory steps by following the procedure in Section 4.6, "Preparing for Installing from a Remote Distribution Source."
5. Determine your workstation's CPU type (*<cpu>*) using one of the commands in Section 7.2, "Getting the CPU Type of a Workstation."
6. If IRIX is running, shut the system down in one of the following ways:
 - From the System menu choose "System Shutdown".
 - From a shell, become the superuser and bring the system down by typing:

```
% /bin/su -  
Password:  
# /etc/shutdown
```
7. If your workstation's CPU type is IP4, skip to Step 14.
8. If your workstation's CPU type is IP19, IP20, or IP22, skip to Step 21.

9. When you see this message on your IP5, IP6, IP7, IP9, IP12, or IP17 workstation:

Okay to power off the system now.

Press any key to restart.

press any key, for example:

<Enter>

10. If you see the message:

Starting up the system...

To perform system maintenance instead, press **<Esc>**.

then press:

<Esc>

within 5 or 10 seconds (the amount of time you have depends on your PROM version). If you do not press **<Esc>** quickly enough, the system reboots, and you have to log in and begin again at Step 6 in this section.

11. This menu or a similar one appears:

System Maintenance Menu

- 1) Start System
- 2) Install System Software
- 3) Run Diagnostics
- 4) Recover System
- 5) Enter Command Monitor

Option?

Choose Enter Command Monitor by pressing:

5

You may or may not need to press **<Enter>**. You should now see the Command Monitor message and the prompt **>>**.

12. Get the value of the non-volatile random access memory (NVRAM) variable *netaddr* by giving this command:

Command Monitor. Type "exit" to return to the menu.

```
>> printenv netaddr
```

Compare the IP address it returns with *<localIPaddress>*. If they are not the same, change the value of *netaddr* to match *<localIPaddress>* with this command:

```
>> setenv netaddr <localIPaddress>
```

13. If your workstation's CPU type is IP6, IP12, or IP17, skip to Step 16.
14. Give two commands to load the miniroot and begin execution of *inst*. They are:

```
>> setenv tapedevice bootp(<server>:/dev/tape  
>> boot -f $tapedevice(sash.<cpu>) --m
```

<cpu> should be one of IP4, IP5, IP7, or IP9. During the next few minutes, several messages and five to seven rows of dots appear as the miniroot is copied into the swap partition on your workstation.

15. Skip to Step 35.
16. If there is a tape drive on your IP6, IP12, or IP17 workstation (it is shown in *hinv* output if present), give this command to set the PROM variable *notape*:

```
>> setenv notape 1
```

17. Return to the System Maintenance Menu:

```
>> exit
```

18. Choose Install System Software by pressing:

```
2
```

You may or may not need to press **<Enter>**.

19. The screen clears and you see the messages and prompts below or something similar. Enter **y** at the first prompt, **<server>** at the second prompt, and **<Enter>** at the third prompt:

Installing System Software...

Press **<Esc>** to return to the menu.

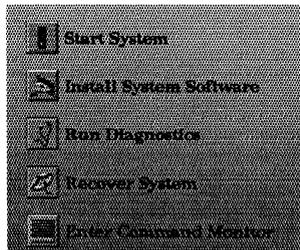
Are you using a remote tape? (y/n): **y**

Enter the hostname of the server with the tape drive: **<server>**

Insert the installation tape, then press **<enter>**: **<Enter>**

During the next few minutes, a message and some rows of dots appear as the miniroot is copied into the swap partition on your workstation.

20. Skip to Step 35.
21. Click the *Restart* button or press **<Enter>** when you see this message on your IP19, IP20, or IP22 workstation:
- Okay to power off the system now.
Press any key to restart.
- This message appears:
- Starting up the system...
22. Click the *Stop for Maintenance* button or press **<Esc>** immediately, since you have just five seconds before the message disappears and IRIX starts up. This menu or one similar to the menu in Step 11 appears:



23. Click the icon for Install System Software or type **2**. The menu is replaced by an Install System Software screen with four icons.
(On an ASCII console, instead of four icons, you see some messages and this list of four items:
1) Remote Tape 2) Remote Directory 3) Local CD-ROM 4) Local Tape
These four items match the icons in the graphics version. Square brackets around an item indicate that it is the current selection.)
24. Click the Remote Tape icon or type **1**. This message and an entry field appear:
Enter the name of the remote host:
25. If you are using the tape drive linked to */dev/tape* on the remote workstation, skip to Step 31.
26. Enter the name of the remote workstation and the tape device name:
<server>: <tapedevice>
where *<tapedevice>* is a fixed block, byte-swapped device (see Section 7.4, "Choosing Tape Device Names," for more information).
27. Click the *Accept* button or press **<Enter>**. A message like this appears:
Remote tape from server *<server>: <tapedevice>*.
28. If the Remote tape message you see includes *<tapedevice>*, skip to Step 33.
29. Click the *Cancel* button or press **<Esc>**. (The PROMs on your workstation require you to use the Command Monitor to load the miniroot instead.)
30. Follow the procedure in Section 7.1, "Loading the Miniroot from the Command Monitor." When you are done, go on to Chapter 5.
31. Enter the name of the remote workstation:
<server>
32. Click the *Accept* button or press **<Enter>**. A message like this appears:
Remote tape from server *<server>*.
33. Click the *Install* button or press **<Enter>**. This message appears:
Insert the installation tape now.
Insert a tape with Installation Tools if you haven't done so already.

34. Click the *Continue* button. This message appears briefly:

```
Obtaining installation tools from <server>:<tapedevice>
```

This message or a similar one is shown:

```
Copying installation tools to disk
```

as the miniroot is copied to the swap partition on your workstation. Copying the miniroot takes many minutes. The status bar or dots indicate the progress of the copy.

35. The output in Figure 4-2 is displayed as *inst* is invoked automatically. *<version>* matches the last few digits of the release number of the software you are trying to install. *<longversion>* is an integer whose value doesn't matter. *<date>* should be the current date and time. *<root_device>* is the device pathname of your root file system. *<source>* is the distribution source. In this case it is "*@<server>:/dev/nrtape*".



If the date is off by more than a few minutes, reset the date with this command:

```
Inst> admin date <mmddhhmmyy>
```

<mmddhhmmyy> is described in the date discussion in Section 10.1.

36. If you do not plan to install any of the products on the tape that contains the Installation Tools, remove the tape from the tape drive now and replace it with the next tape you plan to install. It is not necessary to give the *from* command.

Go on to Chapter 5.

4.7.5 Miniroot Installation from a Remote Distribution Directory

This section contains the procedure for loading the miniroot and invoking *inst* using a remote distribution directory as the software distribution source.

1. Make sure that the power is turned on. Turn on the monitor and any peripherals that have their own On/Off switches first, and then turn on the main unit.
2. Get the name of the remote workstation (*<server>*), the user ID to be used on the remote workstation (*<user>*), the IP address of the remote workstation (*<IPaddress>*), and your workstation's IP address (*<localIPaddress>*), and perform other preparatory steps by following the procedure in Section 4.6, "Preparing for Installing from a Remote Distribution Source."
3. Get the full pathname of the distribution directory. This pathname is the value of *<distdir>* that you need later.
4. Make sure that you can access the distribution directory by giving the command below from your workstation (or another workstation other than *<server>* if your workstation is not running IRIX).

```
% /usr/bsd/rsh <server> -l <user> 'ls <distdir>'
```

If you get an error, or you do not see a list of files whose names begin with product names plus a file named *sa*, you should diagnose and solve the problem using the information in Sections 8.2.2 and 8.2.6 before continuing.

5. Determine your workstation's CPU type (*<cpu>*) using one of the commands in Section 7.2, "Getting the CPU Type of a Workstation."
6. If IRIX is running, shut the system down in one of the following ways:
 - From the System menu choose "System Shutdown".
 - From a shell, become the superuser and bring the system down by typing:

```
% /bin/su -  
Password:  
# /etc/shutdown
```
7. If your workstation's CPU type is IP4, skip to Step 14.
8. If your workstation's CPU type is IP19, IP20, or IP22, skip to Step 22.

9. When you see this message on your IP5, IP6, IP7, IP9, IP12, or IP17 workstation:

Okay to power off the system now.

Press any key to restart.

press any key, for example:

<Enter>

10. If you see the message:

Starting up the system...

To perform system maintenance instead, press **<Esc>**.

then press:

<Esc>

within 5 or 10 seconds (the amount of time you have depends on your PROM version). If you do not press **<Esc>** quickly enough, the system reboots, and you have to log in and begin again at Step 6 in this section.

11. This menu or a similar one appears:

System Maintenance Menu

- 1) Start System
- 2) Install System Software
- 3) Run Diagnostics
- 4) Recover System
- 5) Enter Command Monitor

Option?

Choose Enter Command Monitor by pressing:

5

You may or may not need to press **<Enter>**. You should now see the Command Monitor message and the prompt **>>**.

12. Get the value of the variable *netaddr* by giving this command:

```
Command Monitor. Type "exit" to return to the menu.  
>> printenv netaddr
```

Compare the IP address it returns with *<localIPaddress>*. If they are not the same, change the value of *netaddr* to match *<localIPaddress>* with this command:

```
>> setenv netaddr <localIPaddress>
```

13. If your workstation's CPU type is IP6, IP12, or IP17 skip to Step 16.
14. Give two commands to load the miniroot and begin execution of *inst*. They are:

```
>> setenv tapedevice bootp(<server>:<distdir>/sa  
>> boot -f $tapedevice(sash.<cpu>) --m
```

15. Skip to Step 31.
16. If there is a tape drive on your IP6, IP12, or IP17 workstation (it is shown in *hinv* output if present), give this command to set the PROM variable *notape*:

```
>> setenv notape 1
```

17. Return to the System Maintenance Menu:

```
>> exit
```

18. Choose Install System Software by pressing:

```
2
```

You may or may not need to press **<Enter>**.

19. You will see the messages below or something similar. Enter **n** at the prompt:

```
Installing System Software...  
  
Press <Esc> to return to the menu.  
  
Are you using a remote tape? (y/n) n
```

20. The next prompt has this message or a similar one.

Enter the hostname of the server that has the installation software
(e.g. hostname:directory):

Your response is:

<server>: <distdir>

During the next few minutes, a message and some rows of dots appear as the miniroot is copied into the swap partition on your workstation.

21. Skip to Step 31.

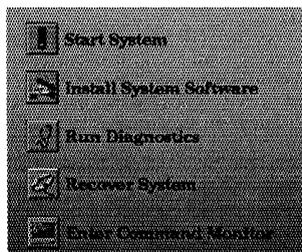
22. Click the *Restart* button or press **<Enter>** when you see this message on your IP19, IP20, or IP22 workstation:

Okay to power off the system now.
Press any key to restart.

This message appears:

Starting up the system...

23. Click the *Stop for Maintenance* button or press **<Esc>** immediately, since you have just five seconds before the message disappears and IRIX starts up. This menu or one similar to the menu in Step 11 appears:



24. Click the icon for *Install System Software* or type **2**. The menu is replaced by an *Install System Software* screen with four icons.

(On an ASCII console, instead of four icons, you see some messages and this list of four items:

1) Remote Tape 2) Remote Directory 3) Local CD-ROM 4) Local Tape

These four items match the icons in the graphics version. Square brackets around an item indicate that it is the current selection.)

25. Click the Remote Directory icon or type **2**. This message and an entry field appear:
Enter the name of the remote host:
26. Enter the name of the workstation that has the software distribution directory you plan to use:
`<server>`
27. Click the *Accept* button or press **<Enter>**. This message and an entry field appear:
Enter the remote directory:
28. Enter the name of the distribution directory:
`<distdir>`
29. Click the *Accept* button or press **<Enter>**. A message like this appears:
Remote directory `<distdir>` from server `<server>`.
30. Click the *Install* button or press **<Enter>**. This message appears briefly:
Obtaining installation tools from `<server>:<distdir>`
This message or a similar one is shown:
Copying installation tools to disk
as the miniroot is copied to the swap partition on your workstation.
Copying the miniroot takes many minutes. The status bar or dots indicate the progress of the copy.
31. The output in Figure 4-2 is displayed as *inst* is invoked automatically. `<n>`, `<m>`, `<o>`, `<p>`, and `<longversion>` are integers whose values don't matter. `<version>` matches the last few digits of the release number of the software you are trying to install. `<date>` should be the current date and time. `<root_device>` is the device pathname of your root file system. `<source>` is the distribution source. Its value is `<server>:<distdir>`.



If the date is off by more than a few minutes, reset the date with this command:

```
Inst> admin date <mmddhhmmyy>
```

`<mmddhhmmyy>` is described in the date discussion in Section 10.1.

Go on to Chapter 5.

4.7.6 IRIX Installation from Local or Remote CD-ROM, Tape, or Distribution Directory

This section contains the procedure for invoking *inst* from an IRIX shell with local or remote tape, CD-ROM, or distribution directory as the software distribution source. See Section 4.2, "Identifying Your Software Distribution Source," for more information on distribution sources.



1. If your distribution source is tape, retension your tape(s), and clean your tape drive heads, if possible, as described in Section 8.2.4. This step could prevent problems later.
2. If your distribution source is local CD-ROM, insert the first CD into the caddy and the caddy into the CD-ROM drive on your workstation. Make sure that the label is up. (See Section 4.4, "Deciding the Installation Order of Software Distributions if you don't know which CD to insert first.") The value of *<CDdir>* that you need later is *"/CDROM"*.
3. If your distribution source is tape, insert the first tape into the tape drive you plan to use. (See Section 4.4," if you don't know which tape to insert first.) Engage the tape heads by locking the tape in place. If you can't lock the tape, it isn't inserted correctly. Take the tape out, rotate it, and try again.
4. If your distribution source is distribution directory, get the full pathname of the distribution directory. This pathname is the value of *<distdir>* that you will need later.
5. If your distribution source is remote, do some preparatory steps, get the name of the remote workstation (*<server>*) and the user ID to be used on the remote workstation (*<user>*) by following the procedure in Section 4.6, "Preparing for Installing from a Remote Distribution Source." If your distribution source is a remote CD, also get the name of the directory that the CD is mounted at on the remote workstation (*<CDdir>*) and start *cdinstmgr* on the remote workstation.
6. To invoke *inst* from IRIX, you must first log in as *root* or become the superuser by giving the command:

```
% /bin/su -  
Password:  
#
```

7. Invoke *inst*:

```
# /usr/sbin/inst
```

A couple of message lines and the Inst Main Menu (shown in Figure 4-3) appear. *<source>* is the current distribution source and may or may not be the distribution source you want to use. Its value is the last distribution source you used when you last used *inst*.

Default location of new software is *<source>*

If you are a first-time *inst* user, give the command "help beginner".

Inst Main Menu

1. from [source]	Specify location of software to be installed
2. list [keywords] [names]	Display information about software subsystems
3. go	Perform software installation and removal now
4. install [keywords] [names]	Select subsystems to be installed
5. remove [keywords] [names]	Select subsystems to be removed
6. keep [keywords] [names]	Do not install or remove these subsystems
7. step [keywords] [names]	Enter interactive mode for install/remove/keep
8. versions [args]	Get information about installed software
9. help [topic]	Get help in general or on a specific word
10. admin	Go to the Administrative Commands Menu
11. quit	Terminate software installation

Inst>

Figure 4-3 Initial Output of *inst* Command

8. If *<source>* is not the distribution source you want to use, change it using the *from* command:

```
Inst> from <argument>
```

where *<argument>* is the location of the software distribution. Table 4-2 shows the *from* command and its *<argument>* for the six possible distribution sources. Additional information about the syntax for the distribution source is described in Section 10.2, "From Arguments."

Distribution Source	from Command
Local tape	from tape
Local CD-ROM (if supported)	from /CDROM/dist
Local distribution directory	from <distdir>
Remote tape	from <user>@<user>@<server>:tape
Remote CD-ROM	from <user>@<server>:<CDdir>/dist
Remote distribution directory	from <user>@<server>:<distdir>

Table 4-2 from Commands for Various Distribution Sources

Go on to Chapter 5 to continue with the installation.

Using *inst*

This chapter is the second of three that give detailed directions for using inst. It explains the commands you can give in response to inst prompts, explains how to change software distributions during an installation session, and gives three examples of installation sessions.

Using *inst*

This chapter provides basic information about using the commands on *inst* menus to install and remove software. This information is provided in three ways in this chapter:

- Section 5.1, “Overview of Using *inst*,” describes the basic model of how *inst* works. Using *inst* is much simpler when you understand this model.
- The *inst* commands are categorized by menu and by function in Section 5.2, “*inst* Commands.”
- Three sample installation sessions are provided in Sections 5.5 through 5.7. Commentary provides explanations of what *inst* is doing and why the different commands were chosen. Each session shows different installation techniques and different error conditions.

Section 5.3, “Changing Software Distributions,” describes the procedures for changing tapes, CDs, or distribution directories after you’ve completed the installation of one software distribution and are ready to switch to the next one.

Section 5.4, “Getting Help,” explains how to get help and discusses strategies for what to do if you get stuck.

Detailed information about *inst* menu commands is provided in a reference form in Section 10.1, “Commands.” Descriptions of the output from the *list*, *versions*, and *files* commands are provided in Section 10.5, “*list* Output,” Section 10.6, “*versions* Output,” and Section 10.7, “*files* Output.” You may find it helpful to refer to this reference information as you read through this chapter.

The behavior of *inst* and the output from *inst* can be customized using the *set* command. The *set* command has many options that take different values (for example, the *set* option *verbose* can have the values *on* and *off*). To reduce confusion in this chapter, all *set* options have default values in the examples and all descriptions will describe *inst* behavior with the default *set* option values only. Section 10.3, “set Options,” describes the *set* options in a reference format, and Table 10-6 shows the default *set* option values. Chapter 7, “Tips, Tricks, and Advanced Features,” describes the use of many of the *set* options.

5.1 Overview of Using *inst*

This high-level introduction to *inst* presents the model of how *inst* works and the basic steps to install and remove software. Many of the specialized terms defined in previous chapters will be used in this section.

Figure 5-1 shows a flowchart of the basic model for using *inst*. In many of the boxes in the flowchart, the word “*automatic*” and/or one or more *inst* command names appears at the bottom of the box. *automatic* indicates that this step occurs automatically. When command names are shown, you give these commands to initiate the step.

After the Inst Main Menu appears, the first thing you do is specify the software distribution source you want, if it is different than the default. *inst* gives you the default distribution source in a message that it prints prior to first appearance of the Inst Main Menu:

**default distribution
source**

```
Default location of new software is <source>
```

If *<source>* is the correct distribution source, you can continue without giving the *from* command. If *<source>* isn’t correct, use the *from* command to change it.

The next command you give is usually the *list* command. Giving this command initiates the three *automatic* steps in the flowchart: reading product descriptions, making initial *installation selections*, and calculating disk space. The *list* command initiates these actions only when a new distribution is to be read.

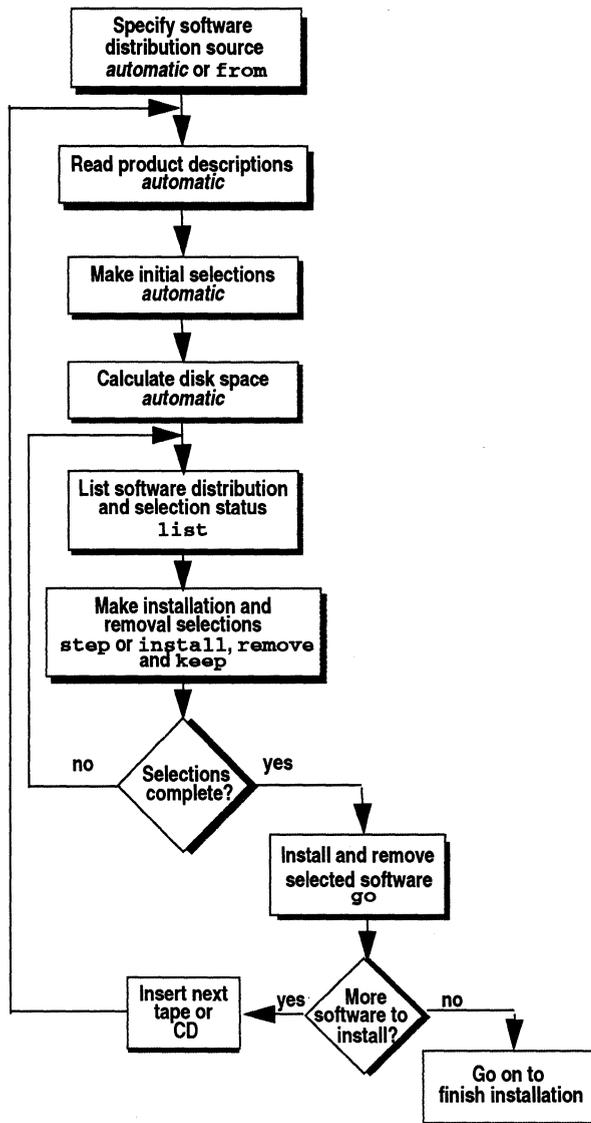


Figure 5-1 Using *inst* Flowchart

reading product descriptions

As *inst* is reading product descriptions, it is getting information about the products in the software distribution source and printing product names and short product descriptions.

initial selections



After reading product descriptions, *inst* makes initial selections. Selection queues a subsystem for installation, removal, or no change (no change is also called *keep*). This `list` display shows you the initial selections *inst* has made (they have an *i* in the first column). The subsystems *inst* selects for installation meet at least one of these criteria:

- The subsystem has not been included in any software distribution ever used as a software distribution source for this workstation, and the subsystem has a * next to its name in the `list` output.
- An older version of the subsystem is currently installed.
- The subsystem replaces an older version of a different subsystem that is currently installed.

disk space changes

When initial selection is done, *inst* computes disk space changes. It is checking to see how much disk space is currently available and calculating the net effect of installing each subsystem in the software distribution. This computation can be time consuming and is a function of the sizes of your root and user file systems and the speeds of your processor, disk drive, and disk controller. Section 7.11, "Controlling Disk Space Checks and Reports," gives some strategies for reducing this time that might apply to your situation.

**selection status
installation status**

Finally, the `list` command displays all of the subsystems in the software distribution. For each subsystem, its *selection status* (*i* for installation, *r* for removal, and *k* for keep/no action), its *installation status* (*X* when the installed version is older than the distribution version, *I* when the distribution software is already installed, and *N* when the installed version is newer than the distribution version), its name, some disk space information, and a short description are given.

You can make additional installation selections with the `install` command and select subsystems that are no longer needed for removal with the `remove` command. *inst* automatically removes older versions of subsystems prior to installing the new version, so you do not need to give commands to remove the installed versions of subsystems you are updating.

keep

A third type of selection you can make, *keep*, is used when you want no change to a subsystem. One way to remember the meaning of the *keep* command is to think “keep this subsystem the way it is.” This means “it’s not installed now and I want it to stay that way” or “it’s installed now and I don’t want it removed” or “it’s installed now and I don’t want a new version installed.” In order to avoid compatibility problems, you should update all currently installed subsystems rather than use *keep* to retain older versions.

interactive mode

Alternatively, the *step* command can be used to make selections. The *step* command is a combination of the *list*, *install*, *remove*, and *keep* commands that puts you into an *interactive mode* that presents the subsystems one at a time and allows you to change their selection status one by one.



You use the *list*, *install*, *remove*, *keep*, and *step* commands until you are satisfied with your selections. Up to this point, no software has been installed onto your workstation or removed from it because selection just queues your requests. The command that initiates installation and removal is the *go* command.

When you give the *go* command, these things happen:

- Subsystems that you have marked for removal (**r**) are removed.
- Subsystems marked for installation (**i**) are installed (the currently installed version, if any, is removed automatically before the new version is installed).

Messages are printed as the removals and installations proceed. *inst* controls the order in which subsystems are installed and removed; the order in which you selected subsystems has no effect.

After the installations and removals are complete, you can change tapes, CDs, or distribution directories if you have more software distributions to install. If not, you are ready to finish up the installation process. Finishing up is discussed in the next chapter.

5.2 *inst* Commands

inst has three menus: the Inst Main Menu shown in Figure 5-2, the Administrative Commands Menu shown in Figure 5-3, and the Interrupt/Error Menu shown in Figure 5-4. The command names appear on the left side with command numbers before them and optional arguments in brackets after them. You substitute your own values for these arguments. On the right side is a short description of the function of each command.



By default these menus are displayed only when you switch from one menu to another. You can redisplay the current menu by pressing **<Enter>** or by typing **? followed by <Enter>**.

The commands on the Inst Main Menu (Figure 5-2) are the basic commands that appear in the *inst* flowchart in Figure 5-1. The menu also includes commands that give you information about already installed software (versions), display on-line help (help), switch menus (admin), or exit *inst* (quit). This menu is the only one many *inst* users will ever need.

Inst Main Menu

1. from [source]	Specify location of software to be installed
2. list [keywords] [names]	Display information about software subsystems
3. go	Perform software installation and removal now
4. install [keywords] [names]	Select subsystems to be installed
5. remove [keywords] [names]	Select subsystems to be removed
6. keep [keywords] [names]	Do not install or remove these subsystems
7. step [keywords] [names]	Enter interactive mode for install/remove/keep
8. versions [args]	Get information about installed software
9. help [topic]	Get help in general or on a specific word
10. admin	Go to the Administrative Commands Menu
11. quit	Terminate software installation

Inst>

Figure 5-2 Inst Main Menu

The commands on the Inst Main Menu are ordered roughly in the order in which they are used. The command names are not case sensitive, although everything else you type while using *inst* is case sensitive. Section 7.7, "Using Command Name Shortcuts," gives some shortcuts for issuing commands.

The Administrative Commands Menu (Figure 5-3) contains rarely-used commands. In general, they allow you to modify *inst*'s behavior and the output that it gives, to get information about the files in subsystems, and to perform certain IRIX system administration functions.

Administrative Commands Menu

1. set [options]	List all options or set/clear an option
2. date [args]	Display or set the system date
3. files [names]	List files in subsystems
4. space	List disk usage information
5. recalculate	Recalculate space required for installation
6. sh [cmd]	Escape to a shell or run a command
7. shroot [cmd]	Escape to a chrooted shell or run a command
8. mount [fsname] [dir]	Show mounted filesystems or mount new ones
9. umount [fsname]	Unmount a filesystem
10. mkfs [devices]	Make new filesystems (/ and /usr by default)
11. return	Go to the Inst Main Menu

Admin>

Figure 5-3 Administrative Commands Menu

The Interrupt/Error Menu (Figure 5-4) is not a menu that you can request explicitly. It appears when certain types of error conditions have occurred and the installation or removal of a subsystem has been partially completed. In these cases you can attempt to restart at the point where the interrupt or error occurred (*continue*) or return to a menu immediately (*stop*).

Interrupt/Error Menu

- | | |
|------------------|---|
| 1. stop | Terminate current command |
| 2. continue | Continue current command |
| 3. set [options] | List all options or set/clear [options] |
| 4. help [topic] | Get help in general or on a specific word |

Interrupt>

Figure 5-4 Interrupt/Error Menu

Categorizing the *inst* commands by function rather than by menu is another way to get an understanding of what the different commands do. Table 5-1 shows the *inst* commands organized by function.

Function	Commands
Specify the software distribution source	from
Display information about software distributions	list, versions, files
Make installation and removal selections	install, remove, keep, step
Install and remove selected software	go, versions remove
Quit or go to another menu	quit, admin, return
Control <i>inst</i> behavior and output	set
Display or update disk space information	space, recalculate
Use an IRIX command	date, sh, shroot, mount, umount, mkfs
Proceed after Interrupt/Error Menu	continue, stop

Table 5-1 *inst* Commands by Function

Table 5-2 categorizes the user-setable options of the `set` command by function.

Function	set Options
Control appearance of displays	<code>clearprompt</code> , <code>columns</code> , <code>fullmenu</code> , <code>lines</code> , <code>menus</code> , <code>overprint</code> , <code>wrapmode</code>
Control content of displays	<code>verbose</code> , <code>verboselist</code> , <code>verboseem</code>
Modify <i>inst</i> behavior	<code>autoselect</code> , <code>beep</code> , <code>delayspacecheck</code> , <code>detailspacecheck</code> , <code>neweroverride</code> , <code>shell</code> , <code>timeout</code>

Table 5-2 `set` Options by Function

5.3 Changing Software Distributions

The sections below give the procedure for switching from one tape, CD, or distribution directory to another. Usually you change tapes, CDs, or distribution directories after a `go` command has completed, but you can change software distributions at any time. Follow the directions in the section below that applies to the type of distribution source you are using.

If you are changing distribution sources, for example switching from tape to a distribution directory, refer to the sections below for both your original and your new distribution source. In this case, you must give the `from` command. In addition, if you are changing to remote CD-ROM, you must start the program `cdinstmgr(1)` as explained in Section 4.6, "Preparing for Installing from a Remote Distribution Source."

5.3.1 Local Tape, Remote Tape, or Local CD-ROM

Two different procedures for changing a local tape, a remote tape, or a local CD are given below. The first procedure is used when you change the tape or CD immediately after the `go` command has completed; the second procedure is used at any other time.

Changing Tapes or Local CDs After `go`

Follow the steps below to change tapes or CDs after the `go` command has completed and displayed this message:

```
Installation and/or removal succeeded.  
You can insert another tape or CD-ROM now.
```

1. If you are using tape, slide or swing the tape drive handle until the tape pops out. Remove the tape, insert the next one, and slide or swing the tape drive handle to lock the tape in the drive.
2. If you are using a CD, press the Eject button on the CD-ROM drive. When the caddy pops out, remove it, replace the CD with the next one you want to use, and replace the caddy in the drive.
3. Continue with your installation, probably by giving the `list` command. Reading the product descriptions in the new software distribution and checking disk space are done automatically the next time you give a `list` or `step` command.

No `from` command is necessary when you change tapes or CDs after the `go` command.

Changing Tapes or Local CDs at Other Times

To change a tape or CD at any time other than after the message "You can insert another tape or CD-ROM now," follow the steps below.

1. If you are using tape, slide or swing the tape drive handle until the tape pops out. Remove the tape, insert the next one, and slide or swing the tape drive handle to lock the tape in the drive.

2. If you are using a CD, press the Eject button on the CD-ROM drive for two seconds. When the caddy pops out, remove it, replace the CD with the next one you want to use, and replace the caddy in the drive.
3. Give the `from` command to tell *inst* that there is a new software distribution. Instead of specifying `<source>` as the argument to `from`, you can use the shorthand `$dist`:

```
Inst> from $dist
```

`$dist` stands for the value of the `set` option `dist`. This option is automatically set to `<source>` every time a distribution source is read. When you change tapes or CDs, but don't switch to a different tape drive or CD-ROM drive, you can use `$dist`.

inst will automatically read the new product descriptions after you give the `from` command.

4. Continue with your installation, probably by giving the `list` command. Checking disk space will be done automatically the next time you give the `list` or `step` command.

5.3.2 Local or Remote Distribution Directory

Follow these steps to change distribution directories at any time:

1. Specify the location of the new distribution directory with the `from` command:

```
Inst> from <argument>
```

You can specify the location of the new distribution as an argument to `from` using the syntax shown in Table 10-3 in Section 10.2, "from Arguments," or if you do not give an argument you will be prompted for the location of the new distribution.

After you give the `from` command, the product descriptions will be read automatically.

2. Continue with your installation, probably by giving the `list` command. Checking disk space will be done automatically the next time you give the `list` or `step` command.

5.3.3 Remote CD-ROM

Follow this procedure for changing remote CDs:

1. *cdinstmgr* should still be running on the remote workstation and displaying this message.

CD on <CDdir> for host <hostname>: type the word "done" when you are finished with this CD, "quit" if you are completely done:

If *cdinstmgr* has been killed, start it up again as described in Section 4.6, "Preparing for Installing from a Remote Distribution Source."

2. To eject the CD, give this command to *cdinstmgr*:

done

If no one else is using the CD, the CD is ejected, and following message from *cdinstmgr* appears:

CD on <CDdir> for host <hostname>: press RETURN when CD is in drive and ready

3. If other users are using the CD, *cdinstmgr* informs you with this message and doesn't eject the CD:

Unable to eject CD, it is in use:

The CD-ROM drive is in use by installs from the following host(s):

<name>

...

CD on <CDdir> for host <hostname>: type the word "done" when you think other users have finished, "quit" if you are completely done:

You cannot eject the CD while others are using it, so you must wait until they are done. The <name> list contains the names of other workstations using the CD-ROM drive.

Respond to the prompt with **done** when the CD is no longer in use by others. If you mistakenly enter **done** while the CD is still in use, you get the same message again. Go on to the next step once the CD is ejected.

4. Insert the next CD into the caddy with the label up and reinsert the caddy into the CD-ROM drive.
5. Press the <Enter> key to respond to the *cdinstmgr* message that prompts you to press RETURN:

<Enter>

6. A message about the CD and its contents appears. It ends with the following:

CD on <CDdir> for host <hostname>: type the word "done" when you are finished with this CD, "quit" if you are completely done:

Do not respond to this prompt until you have finished installing software from this CD. The new CD is ready for installation.

5.4 Getting Help



The `help` command provides extensive online help. To use it, give the command `help` and possibly follow it with a word or letter argument. Almost every word you see in every *inst* menu can be used as a `help` argument, as well as single characters you see in `list` and `step` output and many other words. If you give the `help` command without an argument, you get a list of all possible `help` arguments.

Understanding installation terminology and *inst*'s installation model are very important in using *inst* successfully. Information about *inst*'s models is provided by the command:

```
Inst> help beginner
```

Section 1.1, "Installation Process Model," Section 4.1, "Overview of Bringing Up *inst*," Section 5.1, "Overview of Using *inst*," and Section 6.1, "Overview of Finishing Up Installation," in this guide describe *inst* models as well. You might find it helpful to review these models if you are confused.

Information on installation issues for specific products is provided in the *Release Notes* for the products. In particular, *Release Notes* list prerequisites and the subsystems that must be installed using Miniroot Installation.

Chapter 8, "Installation Troubleshooting," contains diagnostic and troubleshooting information. Sections 8.1, "Error Message Types," and 8.2, "Diagnostic Procedures," help you understand the types of error messages you might see and give some tips for what to do next if you get an error. The most common error messages are discussed in detail in Section 8.4, "Problems While Using *inst*."

5.5 Sample Session 1

This section contains the text of an *inst* session. This session uses Miniroot Installation, a local tape drive, and a tape that contains 4D1-4.0 Installation Tools and *oe1*. The workstation currently has 4D1-3.3 installed. The session demonstrates the use of *install* and *keep* to make selections.

This and the following example sessions are shown as if the *textport*/window were infinitely tall. Commentary is inserted in indented, regular font paragraphs.

```
Current system date is Fri Feb 26 16:05:11 PDT 1993
```

```
Mounting file systems:
```

```
  /dev/dsk/dks0d1s0 on /root
  /root/dev/usr     on /root/usr
```

```
Default location of new software is tape
```

The software distribution source is local tape.

If you are a first-time *inst* user, give the command "help beginner".

```
Inst Main Menu
```

1. from [source]	Specify location of software to be installed
2. list [keywords] [names]	Display information about software subsystems
3. go	Perform software installation and removal now
4. install [keywords] [names]	Select subsystems to be installed
5. remove [keywords] [names]	Select subsystems to be removed
6. keep [keywords] [names]	Do not install or remove these subsystems
7. step [keywords] [names]	Enter interactive mode for install/remove/keep
8. versions [args]	Get information about installed software
9. help [topic]	Get help in general or on a specific word
10. admin	Go to the Administrative Commands Menu
11. quit	Terminate software installation

Give the *list* command to see what subsystems are in the software distribution.

```
Inst> list
```

```
Reading installation history database
```

inst is reading information about currently installed software and previous software distributions from the installation history database.

```
Reading product description from /dev/nrtape:
```

One line for each available product is displayed.

```
eoel      Execution Only Environment 1 4D1-4.0
```

Computing disk space changes:

```
eoel
```

Reading the installation history database, reading the product descriptions, and computing disk space were done because they hadn't yet been done for this software distribution source. These operations may take a few minutes. They are not done every time you give the `list` command.

```
i = installation requested          I = already installed
r = removal requested              X = older version installed
k = no action/keep existing version N = newer version installed
```

```
* = default subsystem at initial installation
@ = subsystem must be installed from the miniroot
+ = subsystem required for basic system functionality
```

Subsystems available for installation (list installable):

	Subsystem	/	/usr	Description
i	eoel.man.audio *	0	90+	Audio Manual Pages
	eoel.man.relnotes *	0	189+	Workstation Release Notes
	eoel.man.slip *	0	12+	SLIP Manual Page
	eoel.man.unix	0	4773+	Basic UNIX documentation
i	eoel.sw.audio *	3+	529+	Audio Software
i	eoel.sw.cpp *	0	0	Source Code Preprocessor
i	eoel.sw.lib *@+	23+	1457+	Execution Library
	eoel.sw.quotas	5+	803+	BSD Disk Quotas
	eoel.sw.slip *	0	321+	SLIP Software
i X	eoel.sw.unix *@+	4279-	5269+	Basic UNIX

The subsystems in this list are the subsystems available for installation. The installation selections that *inst* has made have an *i* in the first column. Only the subsystem with *X* in the second column is currently installed. The two subsystems with *+* after their names, *eoel.sw.lib* and *eoel.sw.unix*, are required for basic system functionality according to the legend above, so we make a mental note that they have to be selected for installation. The second and third columns show the change in disk space in */* and */usr* if each of these subsystems were installed.

Disk space summary (512-byte blocks):

Effect of install selections	4253-	7345+
Effect of remove selections	0+	0+
Installation overhead	15+	104+
Net change in blocks	4238-	7449+
Blocks available	11340+	419823+

Since the number of blocks available on the disk (11340 blocks in the / file system and 419823 blocks in the /usr file system) is more than the additional disk space that would be taken up by these installation selections (7449 additional blocks used in the /usr file system and 4238 fewer blocks taken up in the / file system), plenty of disk space is available for this installation.

Now select *eoel.man.relnotes* for installation.

Inst> **install eoel.man.relnotes**



Next, choose not to install *eoel.man.audio* and *eoel.sw.audio* with the **keep** command. To remember the meaning of **keep**, think "keep things the disk the way it is" or "keep the second column the way it is." In this case, it means keep these subsystems uninstalled. * is used as a wildcard for the product and image names.

Inst> **keep *.*.audio**

Check the current installation selections with **list**.

Inst> **list**

i = installation requested	I = already installed
r = removal requested	X = older version installed
k = no action/keep existing version	N = newer version installed

* = default subsystem at initial installation
@ = subsystem must be installed from the miniroot
+ = subsystem required for basic system functionality

Subsystems available for installation (list installable):

Subsystem	/	/usr	Description
eoel.man.audio *	0	90+	Audio Manual Pages

This line tells us that *eoel.man.audio* is not selected for installation, but if it were installed, our disk space usage in the root file system (/) would not change. *eoel.man.audio* would take up 90 blocks on the */usr* file system if it were installed.

```
i  eoel.man.relnotes *          0          189+ Workstation Release Notes
```

eoel.man.relnotes is selected for installation. Again, the disk space numbers tell us what the change (+ for increase or - for decrease) will be if the subsystem is installed.

```

eoel.man.slip *          0          12+ SLIP Manual Page
eoel.man.unix           0         4773+ Basic UNIX documentation
eoel.sw.audio *         3+         529+ Audio Software
i  eoel.sw.cpp *         0           0 Source Code Preprocessor
i  eoel.sw.lib *@+       23+        1457+ Execution Library
eoel.sw.quotas          5+         803+ BSD Disk Quotas
eoel.sw.slip *          0          321+ SLIP Software
i X eoel.sw.unix *@+     4279-        5269+ Basic UNIX

```

An older version of *eoel.sw.unix* is already installed. From looking at these numbers, we can guess that a lot of files that used to be in the / file system have moved to the */usr* file system in this new release.

Disk space summary (512-byte blocks):

```

Effect of install selections 4256-    6915+
Effect of remove selections   0+       0+
Installation overhead        15+      102+

Net change in blocks         4241-    7017+
Blocks available             11340+  419823+

```

These installation selections look good, so it's time to start the installation of files.

```
Inst> go
```

```

Removing old versions of selected eoel.sw subsystems
Installing new versions of selected eoel.sw subsystems
Installing new versions of selected eoel.man subsystems

```

```

Installation and/or removal succeeded.
You can insert another tape or CD-ROM now.

```

The installations from this software distribution have been completed, so take the *eoel* tape out of the tape drive and put in the next tape. Give the `list` command and use the same procedure as already shown. When you're finished with all of your tapes, you can finish up the installation using the steps in the next chapter.

5.6 Sample Session 2

In this sample session, IRIX Installation is being used to install the *c* (C Compiler) product from a remote CD-ROM drive. This product and its predecessors have never before been available for installation on this workstation. *cdinstmgr* has already been started up on the remote workstation (see Section 4.6, "Preparing for Installing from a Remote Distribution Source"). This session demonstrates the *from* command, using *step* to make selections, using the *list* command with a keyword, and a network timeout error.

Default location of new software is `guest@bigserver:/CDROM/dist`

In this example *inst* was invoked from the shell without any arguments, so the default locations is the distribution source used for the last installation. It was a CD on the workstation called *bigserver*.

If you are a first-time *inst* user, give the command "help beginner".

Inst Main Menu

1. <i>from</i> [source]	Specify location of software to be installed
2. <i>list</i> [keywords] [names]	Display information about software subsystems
3. <i>go</i>	Perform software installation and removal now
4. <i>install</i> [keywords] [names]	Select subsystems to be installed
5. <i>remove</i> [keywords] [names]	Select subsystems to be removed
6. <i>keep</i> [keywords] [names]	Do not install or remove these subsystems
7. <i>step</i> [keywords] [names]	Enter interactive mode for install/remove/keep
8. <i>versions</i> [args]	Get information about installed software
9. <i>help</i> [topic]	Get help in general or on a specific word
10. <i>admin</i>	Go to the Administrative Commands Menu
11. <i>quit</i>	Terminate software installation

We know that several products are included on this CD from looking at its label or the output of *cdinstmgr*, but we want to install *c* only. We'll save time by giving the *from* command with the product name at the end.

```
Inst> from bigserver:/CDROM/dist/c
```

```
Reading installation history database
```

```
Reading product description from guest@bigserver:/CDROM/dist/c:
```

```
  c           Ansi C 1.1
```

Reading the installation history database and the *c* product description is automatically done after the *from* command.

```
Inst> list
```

Computing disk space changes:

c

The *list* command causes the disk space calculation to be done; it hadn't been done yet after the *from* command.

```
i = installation requested          I = already installed
r = removal requested              X = older version installed
k = no action/keep existing version N = newer version installed
```

```
* = default subsystem at initial installation
@ = subsystem must be installed from the miniroot
+ = subsystem required for basic system functionality
```

Subsystems available for installation (list installable):

Subsystem	/	/usr	Description
i c.hdr.lib *	0	680+	Ansi C Library Headers

c.hdr.lib is selected for installation. The disk space numbers tell us what the change (+ for increase or - for decrease in disk usage) will be if the subsystem is installed. In this case, 680 more blocks would be used on the */usr* file system.

i c.hdr.libgl *	0	234+	Ansi C Graphic Library Headers
i c.man.c *	0	59+	Ansi C Compiler Man Pages
i c.man.lib *	0	3092+	Ansi C Library Man Pages
i c.man.libgl *	0	1763+	Ansi C Graphic Library Man Pages
i c.man.relnotes *	0	23+	Ansi C Release Notes
i c.man.util *	0	73+	Ansi C Utility Man Pages
c.opt.tutedge	0	15+	Ansi C Edge Tutorial

This line tells us that *c.opt.tutedge* is not selected for installation, but if it were installed, our disk space usage in the root file system would not change. *c.opt.tutedge* would take up 15 blocks on the */usr* file system if it were installed.

i c.sw.c *	0	802+	Ansi C Compiler
i c.sw.lib *	0	3571+	Ansi C Libraries
c.sw.libG0	0	3395+	Ansi C Libraries (-G0)
i c.sw.util *	0	850+	Ansi C Utilities

In this example, this workstation has never had the *c* product (or *dev*, which used to contain the C compiler) available to it for installation. Thus, *inst*'s default installation selections are the subsystems with * after their names.

Disk space summary (512-byte blocks):

```
Effect of install selections    0+   11147+
Effect of remove selections    0+     0+
Installation overhead          0+    213+

Net change in blocks           0+   11360+
Blocks available               16203+ 419823+
```

In this example, we're going to use the *step* command to make installation and removal selections.

Inst> **step**

```
i = installation requested      I = already installed
r = removal requested          X = older version installed
k = no action/keep existing version  N = newer version installed
```

```
* = default subsystem at initial installation
@ = subsystem must be installed from the miniroot
+ = subsystem required for basic system functionality
```

The *step* command uses overprinting which is hard to simulate. You'll see three lines below for every subsystem (only one appears when you're actually using *inst*). The first line is printed by *inst*. The second line is your response (always a single keystroke). The third line shows how the line looks after your response. Only the first character in the line changes.

```
i   c.hdr.lib *                0      680+ Ansi C Library Headers
<Enter>
```

Use the <Enter> key whenever you don't want to make a change in the selection status; the first column remains unchanged.

```
i   c.hdr.lib *                0      680+ Ansi C Library Headers
i   c.hdr.libgl *              0      234+ Ansi C Graphic Library Headers
<Enter>
i   c.hdr.libgl *              0      234+ Ansi C Graphic Library Headers
i   c.man.c *                  0       59+ Ansi C Compiler Man Pages
k
```

In this case, k was used to change the selection status to no action (keep the subsystem the way it is: uninstalled).

```

c.man.c *                0          59+ Ansi C Compiler Man Pages
i c.man.lib *            0        3092+ Ansi C Library Man Pages
k
c.man.lib *              0        3092+ Ansi C Library Man Pages
i c.man.libgl *          0        1763+ Ansi C Graphic Library Man Pages
k
c.man.libgl *            0        1763+ Ansi C Graphic Library Man Pages
i c.man.relnotes *       0          23+ Ansi C Release Notes
<Enter>
i c.man.relnotes *       0          23+ Ansi C Release Notes
i c.man.util *           0          73+ Ansi C Utility Man Pages
k
c.man.util *             0          73+ Ansi C Utility Man Pages
i c.opt.tutedge          0          15+ Ansi C Edge Tutorial
i

```

In this case, the i key was pressed to select this subsystem for installation; it wasn't previously selected.

```

i c.opt.tutedge          0          15+ Ansi C Edge Tutorial
i c.sw.c *               0        802+ Ansi C Compiler
<Enter>
i c.sw.c *               0        802+ Ansi C Compiler
i c.sw.lib *             0       3571+ Ansi C Libraries
<Enter>
i c.sw.lib *             0       3571+ Ansi C Libraries
c.sw.libG0               0       3395+ Ansi C Libraries (-G0)
<Enter>
c.sw.libG0               0       3395+ Ansi C Libraries (-G0)
i c.sw.util *           0          850+ Ansi C Utilities
<Enter>
i c.sw.util *           0          850+ Ansi C Utilities

```

Disk space summary (512-byte blocks):

```

Effect of install selections  0+   9570+
Effect of remove selections   0+     0+
Installation overhead         0+    83+

Net change in blocks          0+   9653+
Blocks available              16203+ 419823+

```

Inst> list i

This example shows using a keyword with the list command. The i keyword means "all the subsystems with an i in front of them." This command is used to check out installation selections.

i = installation requested I = already installed
 r = removal requested X = older version installed
 k = no action/keep existing version N = newer version installed

* = default subsystem at initial installation
 @ = subsystem must be installed from the miniroot
 + = subsystem required for basic system functionality

Subsystems selected for installation (list install, marked i):

This heading reminds us what keyword we've used.
list i and **list install** are synonymous.

Subsystem	/	/usr	Description
i c.hdr.lib *	0	680+	Ansi C Library Headers
i c.hdr.libgl *	0	234+	Ansi C Graphic Library Headers
i c.man.relnotes *	0	23+	Ansi C Release Notes
i c.opt.tutedge	0	15+	Ansi C Edge Tutorial
i c.sw.c *	0	802+	Ansi C Compiler
i c.sw.lib *	0	3571+	Ansi C Libraries
i c.sw.util *	0	850+	Ansi C Utilities

Disk space summary (512-byte blocks):

Effect of install selections	0+	6175+
Effect of remove selections	0+	0+
Installation overhead	0+	82+
Net change in blocks	0+	6257+
Blocks available	16203+	419823+

We begin the installation with go.

Inst> go

Installing new versions of selected c.sw subsystems

inst: network timeout on guest@bigserver:/CDROM/dist.See "help timeouterror".

An error has occurred during the installation. From the message we learn that a network timeout has occurred.

Interrupt/Error Menu

1. stop	Terminate current command
2. continue	Continue current command
3. set [options]	List all options or set/clear [options]
4. help [topic]	Get help in general or on a specific word

Interrupt> stop

We could have given the command **help timeouterror** as suggested in the message to learn more about this error. Instead we gave the stop command. For timeout errors, always give the stop command rather than the continue command.

Inst Main Menu

- | | |
|-------------------------------|--|
| 1. from [source] | Specify location of software to be installed |
| 2. list [keywords] [names] | Display information about software subsystems |
| 3. go | Perform software installation and removal now |
| 4. install [keywords] [names] | Select subsystems to be installed |
| 5. remove [keywords] [names] | Select subsystems to be removed |
| 6. keep [keywords] [names] | Do not install or remove these subsystems |
| 7. step [keywords] [names] | Enter interactive mode for install/remove/keep |
| 8. versions [args] | Get information about installed software |
| 9. help [topic] | Get help in general or on a specific word |
| 10. admin | Go to the Administrative Commands Menu |
| 11. quit | Terminate software installation |

Inst> **set timeout 120**

We give the **set timeout** command to change the timeout value. The set command is available from the Inst Main Menu even though it isn't shown. 360 is double the default value of 180.

Inst> **go**

We restart the installation with go. *inst* has kept track of where it was and begins again at the image that failed.

```
Installing new versions of selected c.sw subsystems
Installing new versions of selected c.hdr subsystems
Installing new versions of selected c.opt subsystems
Installing new versions of selected c.man subsystems
```

```
Installation and/or removal succeeded.
You can insert another tape or CD-ROM now.
```

If you are finished installing software you can finish up the installation using the steps in Chapter 6, "Finishing Up Installation," or you can change CDs (see Section 5.3.3) and continue with the installation.

5.7 Sample Session 3

In this sample session, the 4D1-4.0 versions of the products *eoel*, *eoel2*, *motif_eoe*, and *showcase* are being installed from a local CD-ROM drive with Miniroot Installation. *cdinstmgr* is not being used since the installation is from a local (rather than remote) CD-ROM drive.

This session shows some of the situations in which you would use the Administrative Commands Menu: changing the system date, escaping to a shell in order to remove user files, listing the names of files in a subsystem. It also demonstrates the `versions` command and the "NOT ENOUGH DISK SPACE" and "MISSING PREREQUISITES" errors.

```
Current system date is Fri Dec 31 00:00:00 PDT 2034
```



Note the really crazy date. If the date is off by more than a few minutes it should be reset as shown below, since a bad date can prevent correct installation and cause problems later.

```
Mounting file systems:
  /dev/dsk/dks0d1s0 on /root
  /root/dev/usr      on /root/usr
```

```
Default location of new software is /CDROM/dist
```

```
If you are a first-time inst user, give the command "help beginner".
```

```
Inst Main Menu
```

1. from [source]	Specify location of software to be installed
2. list [keywords] [names]	Display information about software subsystems
3. go	Perform software installation and removal now
4. install [keywords] [names]	Select subsystems to be installed
5. remove [keywords] [names]	Select subsystems to be removed
6. keep [keywords] [names]	Do not install or remove these subsystems
7. step [keywords] [names]	Enter interactive mode for install/remove/keep
8. versions [args]	Get information about installed software
9. help [topic]	Get help in general or on a specific word
10. admin	Go to the Administrative Commands Menu
11. quit	Terminate software installation

The `date` command is on the Administrative Commands Menu rather than the Inst Main Menu. Rather than switching to the other menu, a shortcut is to give the `admin` command followed by a command. You'll get the `Inst>`

prompt back when you're finished. The syntax and output of the date command is identical to *date(1)*. The example uses the *<mmddhhmmyy>* form.

```
Inst> admin date 0226113693
Fri Feb 26 11:36:00 PDT 1993
Inst> list
Reading installation history database
Reading product descriptions from /CDROM/dist:

    eoe1      Execution Only Environment 1 4D1-4.0
    eoe2      Execution Only Environment 2 4D1-4.0
    motif_eoe Motif Execution Only Environment 4D1-4.0
    showcase  IRIS Showcase 4D1-1.2
```

Computing disk space changes:

```
eoe1
eoe2
motif_eoe
showcase
```

When the software distribution contains more than one product, the product names overprint as the disk space changes for each product are calculated.

```
i = installation requested      I = already installed
r = removal requested          X = older version installed
k = no action/keep existing version  N = newer version installed
```

```
* = default subsystem at initial installation
@ = subsystem must be installed from the miniroot
+ = subsystem required for basic system functionality
```

Subsystems available for installation (list installable):

	Subsystem	/	/usr	Description
i	eoe1.man.audio *	0	90+	Audio Manual Pages
	eoe1.man.relnotes *	0	189+	Workstation Release Notes
	eoe1.man.slip *	0	12+	SLIP Manual Page
	eoe1.man.unix	0	4773+	Basic UNIX documentation
i	eoe1.sw.audio *	3+	529+	Audio Software
i	eoe1.sw.cpp *	0	0	Source Code Preprocessor
i	eoe1.sw.lib *@+	23+	1457+	Execution Library
	eoe1.sw.quotas	5+	803+	BSD Disk Quotas
	eoe1.sw.slip *	0	321+	SLIP Software
i X	eoe1.sw.unix *@+	4848-	2781+	Basic UNIX
i	eoe2.man.4Dwm *	0	38+	4Dwm Default Window Manager
	eoe2.man.X11 *	0	657+	X11 Execution Environment Manual Pages

i	eeo2.man.Xapps *	0	462+	Xapps Manual Pages
	eeo2.man.bsdlpr	0	43+	BSD Line Printer Spooling Utilities
i	eeo2.man.cdrom *	0	10+	CD-ROM Manual Pages
	eeo2.man.demos	0	312+	Graphics Demonstration Programs
	eeo2.man.gltools	0	76+	Graphics Library Tools Manual Pages
	eeo2.man.imagetools	0	208+	Graphics Library Image Tools Manual Pages
	eeo2.man.spaceball	0	24+	Spaceball Documentation
i	eeo2.sw.4Dwm *	0	971+	4Dwm Default Window Manager
	eeo2.sw.X100dpifonts *	0	5163+	100dpi X11 Fonts
i X	eeo2.sw.X11 *	1200-	153+	X11 Execution Environment
	eeo2.sw.X75dpifonts *	0	2786+	75dpi X11 Fonts
	eeo2.sw.XMiscfonts *	0	544+	Miscellaneous X11 Fonts
	eeo2.sw.Xapps *	0	12870+	X11 Applications
	eeo2.sw.Xasianfonts	0	463+	Asian Language X11 Fonts
	eeo2.sw.Xdemos *	0	1614+	X11 Demos and Images
	eeo2.sw.acct	174+	835+	System Accounting
	eeo2.sw.bsdlpr	5+	1168+	BSD Line Printer Spooling Utilities
i	eeo2.sw.cdrom *	2+	775+	CD-ROM software
	eeo2.sw.cdsio *	0	48+	Multiport Serial Board Support
i X	eeo2.sw.crypt *	0	0	Security Administration Utilities
i X	eeo2.sw.demos *	0	2047+	Graphics Demonstration Programs

One way to remember the meanings of the letters in the first two columns of list output is to remember that the first column shows your intent for this installation session and the second column shows the current state of the subsystems in the list.

i	eeo2.sw.dps *	0	5459+	DPS Software
i	eeo2.sw.dpsdemo *	0	6043+	DPS demos
i	eeo2.sw.dpsfonts *	0	2073+	DPS fonts
i X	eeo2.sw.envm *	0	5302+	Visual File System Interface
i	eeo2.sw.fonts *	0	314+	Standard Fonts
i X	eeo2.sw.gltools *	0	1788+	Graphics Library Tools
	eeo2.sw.hyper	0	182+	HyperNet Support
	eeo2.sw.ikc	0	30+	Ikon Printer Interface
	eeo2.sw.imagetools	0	5286+	Graphics Library Image Tools
	eeo2.sw.ipgate	0	1339+	IP Network Gateway Support
i X	eeo2.sw.lp *	0	128+	Line Printer Spooling Utilities
	eeo2.sw.more demos	0	10321+	More Graphics Demonstration Programs
	eeo2.sw.named	0	164+	Berkeley Internet Name Domain Server
	eeo2.sw.optfonts	0	2303+	Optional Fonts
i X	eeo2.sw.perf *	16+	121+	Performance Measurement

			Utilities
	eeo2.sw.rcs	0	1937+ Revision Control System Utilities
	eeo2.sw.sccc	0	1850+ Source Code Control System Utilities
	eeo2.sw.spaceball	0	17+ Spaceball Software
	eeo2.sw.spell	0	897+ Spell Utilities
i X	eeo2.sw.sysadm *	16+	16+ System Administration Utilities
i X	eeo2.sw.tcp *	24-	6771- TCP/IP Networking Support
	eeo2.sw.terminf	0	2629+ Terminal Information Utilities
	eeo2.sw.ts	0	29+ VME 1/4" Streaming Tape Support
i X	eeo2.sw.udc *	0	0 UNIX Domain Socket Support
	eeo2.sw.uucp	0	2210+ UUCP Utilities
i X	eeo2.sw.vadmin *	753-	5054+ Visual System Administration Interface
	eeo2.sw.xm	0	49+ Xylogics 1/2" Tape Support

Portions of *eeo1* and *eeo2* were previously installed on this workstation. To make the initial selections for *eeo1* and *eeo2*, *inst* has put an *i* next to all previously installed subsystems, next to all subsystems that replace previously installed, but now obsolete subsystems, and next to all subsystems that are brand new in this release and have a * next to their name.

i	motif_eeo.man.eeo *	0	232+ Window Manager Manual Pages
	motif_eeo.man.eoemansrc	0	186+ Window Manager nroff Manual Pages
i	motif_eeo.man.relnotes *	0	40+ Release Notes
i	motif_eeo.sw.eeo *	0	2817+ Motif Execution Software
	motif_eeo.sw.mwm	0	799+ Motif Window Manager
i	showcase.man.relnotes *	0	34+ Showcase Release Notes
i	showcase.man.showcase *	0	6+ Showcase Manual Pages
i	showcase.sw.images *	0	35+ Showcase Images
i	showcase.sw.models *	0	1212+ Showcase 3D Models
i	showcase.sw.onlinehelp *	0	8438+ Showcase Online Help
i	showcase.sw.showcase *	0	5501+ Showcase Software
i	showcase.sw.templates *	0	356+ Showcase Templates
i	showcase.sw.workspace *	0	44+ Showcase WorkSpace Support

motif_eeo and *showcase* have not been available for installation previously on this workstation, so an *i* appears next to each of their subsystems that is marked with *.

Disk space summary (512-byte blocks):

Effect of install selections	6765-	47555+
Effect of remove selections	0+	0+
Installation overhead	17+	1078+

```
Net change in blocks      6748-  48633+
Blocks available          11340+  23519+
```

Notice that the number of additional blocks in the */usr* file system required to install all of these selections is more than the number of blocks available. We'll try to start the installation anyway just to see what happens. (You'll always get an error.)

```
Inst> go
NOT ENOUGH DISK SPACE
```

Installation of the currently selected subsystems will require more disk space than is currently available. The numbers displayed below show the estimated increase in disk space usage that will result from installing the currently selected subsystems.

```
File system: /dev/usr (mounted as /usr)

Installation requirement:      48633 blocks

Available disk space:         23519 blocks
```

You can decrease the installation requirement by selecting fewer subsystems. You can increase the available disk space by removing unnecessary subsystems or files from the disk. Use "help spaceerror" for more information.

Installation failed.

inst printed this message before performing any installations or removals. We can do three things to recover from this situation: get rid of extra user files, remove some already installed subsystems, or request fewer subsystems for installation.

```
Inst> admin
```

The first thing we'll do is go to the Administrative Commands Menu so that we can escape to a shell and remove a few files from *joe's* home directory.

Administrative Commands Menu

1. set [options]	List all options or set/clear an option
2. date [args]	Display or set the system date
3. files [names]	List files in subsystems
4. space	List disk usage information
5. recalculate	Recalculate space required for installation
6. sh [cmd]	Escape to a shell or run a command

- | | |
|-------------------------|--|
| 7. shroot [cmd] | Escape to a chrooted shell or run a command |
| 8. mount [fsname] [dir] | Show mounted filesystems or mount new ones |
| 9. umount [fsname] | Unmount a filesystem |
| 10. mkfs [devices] | Make new filesystems (/ and /usr by default) |
| 11. return | Go to the Inst Main Menu |

Admin> **shroot**

The shroot command gives us a C shell and hides the fact that file systems are mounted under */root*. A very limited number of IRIX commands is available while we are in the shell since we're using Miniroot Installation.

```
# cd /usr/people/joe
# rm temp* junk core
```

We remove no-longer-needed files in order to get more disk space. When we're finished we use the *exit(1)* command to return to *inst* prompts.

```
# exit
# Admin> recalculate
```

We have to ask *inst* to recalculate the disk space since it doesn't have any idea what we did while we were in the shell.

Computing disk space changes:

```
  eoe1
  eoe2
  motif_eoe
  showcase
```

Now we ask for a disk space summary to see how we are doing.

Admin> **space**

Disk space summary (512-byte blocks):

	/	/usr
Effect of install selections	6765-	47555+
Effect of remove selections	0+	0+
Installation overhead	17+	1078+
Net change in blocks	6748-	48633+
Blocks available	11340+	34823+

We freed about 11,000 blocks when we removed the files, but we still don't have enough space.

We're curious about what's in the subsystem called *eo2.sw.perf*. It looks like something we might be able to remove, so we use the `files` command while we're at the Administrative Commands Menu to list its files.

```
Admin> files eoe2.sw.perf

i X eoe2.sw.perf          f etc/config/sar
i X eoe2.sw.perf          f etc/init.d/perf
i X eoe2.sw.perf          16+ f etc/prfdc
i X eoe2.sw.perf          f etc/prfld
i X eoe2.sw.perf          f etc/prfpr
i X eoe2.sw.perf          f etc/prfsnap
i X eoe2.sw.perf          f etc/prfstat
i X eoe2.sw.perf          l etc/rc2.d/S21perf
i X eoe2.sw.perf          d usr/adm/sa
i X eoe2.sw.perf          f usr/bin/sar
i X eoe2.sw.perf          f usr/bin/timex
i X eoe2.sw.perf          d usr/lib/sa
i X eoe2.sw.perf          f usr/lib/sa/sal
i X eoe2.sw.perf          f usr/lib/sa/sa2
i X eoe2.sw.perf          f usr/lib/sa/sadc
i X eoe2.sw.perf          64+ f usr/sbin/gr_top
i X eoe2.sw.perf          8+ f usr/sbin/osview
i X eoe2.sw.perf          56+ f usr/sbin/systemeter
i X eoe2.sw.perf          f usr/sbin/top
i X eoe2.sw.perf          f usr/spool/cron/crontabs/sys
i X eoe2.sw.perf          7- f usr/sysgen/boot/prf.o
```

This doesn't look like software we need so we'll keep it in mind as a candidate to remove.

```
Admin> return
```

```
Inst Main Menu
```

1. from [source]	Specify location of software to be installed
2. list [keywords] [names]	Display information about software subsystems
3. go	Perform software installation and removal now
4. install [keywords] [names]	Select subsystems to be installed
5. remove [keywords] [names]	Select subsystems to be removed
6. keep [keywords] [names]	Do not install or remove these subsystems
7. step [keywords] [names]	Enter interactive mode for install/remove/keep
8. versions [args]	Get information about installed software
9. help [topic]	Get help in general or on a specific word
10. admin	Go to the Administrative Commands Menu
11. quit	Terminate software installation

```
Inst> keep eoe2.sw.dps*
```

We use this command to prevent installation of all of the Display PostScript® software subsystems.

```
Inst> keep motif_eeo
```

This keep command prevents the installation of the entire *motif_eeo* product.

```
Inst> keep *.man.*
```

```
Inst> install *.*.relnotes
```

These two commands prevent the installation of all of the *man* subsystems except *relnotes*. The **keep motif_eeo** command we gave earlier removed the *i* from *motif_eeo.man.relnotes*, but the **install** command selected it again.

We no longer need *eeo2.sw.perf* or *eeo2.sw.crypt* so we'll remove them.

```
Inst> remove eeo2.sw.perf eeo2.sw.crypt
```

Another option we have is to remove installed subsystems from products that aren't included in the software distribution. We use the *versions* command to see what all of the installed subsystems are.

```
Inst> versions
```

I = Installed, R = Removed

Name	Date	Description
I eoe1	05/28/91	4D1-3.3 Execution Only Environment (part 1)
I eoe1.sw	05/28/91	Execution Only Environment 1 software
I eoe1.sw.tcp	05/28/91	TCP/IP Networking Support
I eoe1.sw.unix	05/28/91	Basic UNIX
I eoe2	05/28/91	4D1-3.3 Execution Only Environment (part 2)
I eoe2.sw	05/28/91	Execution Only Environment 2 software
I eoe2.sw.NeWS	05/28/91	4Sight Windowing System
I eoe2.sw.crypt	05/28/91	Security Administration Utilities
I eoe2.sw.demos	05/28/91	Graphics Demonstration Programs
I eoe2.sw.dfm	05/28/91	Directory and File Management Utilities
I eoe2.sw.editors	05/28/91	Editing Utilities
I eoe2.sw.envm	05/28/91	Visual File System Interface
I eoe2.sw.gltools	05/28/91	Graphics Library Tools

```

I eoe2.sw.ipc          05/28/91  Inter-Process Communication Utilities
I eoe2.sw.lp          05/28/91  Line Printer Spooling Utilities
I eoe2.sw.mast       05/28/91  Graphics Master
I eoe2.sw.perf       05/28/91  Performance Measurement Utilities
I eoe2.sw.sysadm     05/28/91  System Administration Utilities
I eoe2.sw.uds        05/28/91  UNIX Domain Socket Support
I eoe2.sw.usrenv     05/28/91  User Environment Utilities
I eoe2.sw.vadmin     05/28/91  Visual System Administration Interface

I nfs                 05/28/91  3.3 Network File System
I nfs.sw              05/28/91  Network File System software
I nfs.sw.nfs         05/28/91  NFS Support
I nfs.sw.yip         05/28/91  Yellow Pages

```

We'll remove *nfs* to get some more space, then check our selections and disk space.

```

Inst> remove nfs
Inst> list
i = installation requested          I = already installed
r = removal requested              X = older version installed
k = no action/keep existing version N = newer version installed

```

```

* = default subsystem at initial installation
@ = subsystem must be installed from the miniroot
+ = subsystem required for basic system functionality

```

Subsystems available for installation (list installable):

	Subsystem	/	/usr	Description
	eoel.man.audio *	0	90+	Audio Manual Pages
i	eoel.man.relnotes *	0	189+	Workstation Release Notes
	eoel.man.slip *	0	12+	SLIP Manual Page
	eoel.man.unix	0	4773+	Basic UNIX documentation
i	eoel.sw.audio *	3+	529+	Audio Software
i	eoel.sw.cpp *	0	0	Source Code Preprocessor
i	eoel.sw.lib *@+	23+	1457+	Execution Library
	eoel.sw.quotas	5+	803+	BSD Disk Quotas
	eoel.sw.slip *	0	321+	SLIP Software
i X	eoel.sw.unix *@+	4848-	2781+	Basic UNIX
	eoel.man.4Dwm *	0	38+	4Dwm Default Window Manager
	eoel.man.X11 *	0	657+	X11 Execution Environment Manual Pages
	eoel.man.Xapps *	0	462+	Xapps Manual Pages
	eoel.man.bsdlpr	0	43+	BSD Line Printer Spooling Utilities
	eoel.man.cdrom *	0	10+	CD-ROM Manual Pages
	eoel.man.demos	0	312+	Graphics Demonstration Programs
	eoel.man.gltools	0	76+	Graphics Library Tools Manual Pages

	eeo2.man.imagetools	0	208+	Graphics Library Image Tools Manual Pages
	eeo2.man.spaceball	0	24+	Spaceball Documentation
i	eeo2.sw.4Dwm *	0	971+	4Dwm Default Window Manager
	eeo2.sw.X100dpifonts *	0	5163+	100dpi X11 Fonts
i X	eeo2.sw.X11 *	1200-	153+	X11 Execution Environment
	eeo2.sw.X75dpifonts *	0	2786+	75dpi X11 Fonts
	eeo2.sw.XMiscfont * *	0	544+	Miscellaneous X11 Fonts
	eeo2.sw.Xapps *	0	12870+	X11 Applications
	eeo2.sw.Xasianfonts	0	463+	Asian Language X11 Fonts
	eeo2.sw.Xgemos *	0	1614+	X11 Demos and Images
	eeo2.sw.acct	174+	835+	System Accounting
	eeo2.sw.bsdlpr	5+	1168+	BSD Line Printer Spooling Utilities
i	eeo2.sw.cdrom *	2+	775+	CD-ROM software
	eeo2.sw.cdsio *	0	48+	Multiport Serial Board Support
r X	eeo2.sw.crypt *	33-	25-	Security Administration Utilities
i X	eeo2.sw.demos *	0	2047+	Graphics Demonstration Programs
	eeo2.sw.dps *	0	5459+	DPS Software
	eeo2.sw.dpsdemo *	0	6043+	DPS demos
	eeo2.sw.dpsfont * *	0	2073+	DPS fonts
i X	eeo2.sw.envm *	0	5302+	Visual File System Interface
i	eeo2.sw.fonts *	0	314+	Standard Fonts
i X	eeo2.sw.gltools *	0	1788+	Graphics Library Tools
	eeo2.sw.hyper	0	182+	HyperNet Support
	eeo2.sw.ikc	0	30+	Ikon Printer Interface
	eeo2.sw.imagetools	0	5286+	Graphics Library Image Tools
	eeo2.sw.ipgate	0	1339+	IP Network Gateway Support
i X	eeo2.sw.lp *	0	128+	Line Printer Spooling Utilities
	eeo2.sw.more demos	0	10321+	More Graphics Demonstration Programs
	eeo2.sw.named	0	164+	Berkeley Internet Name Domain Server
	eeo2.sw.optfont * *	0	2303+	Optional Fonts
r X	eeo2.sw.perf *	280-	1366-	Performance Measurement Utilities
	eeo2.sw.rcs	0	1937+	Revision Control System Utilities
	eeo2.sw.sccs	0	1850+	Source Code Control System Utilities
	eeo2.sw.spaceball	0	17+	Spaceball Software
	eeo2.sw.spell	0	897+	Spell Utilities
i X	eeo2.sw.sysadm *	16+	16+	System Administration Utilities
i X	eeo2.sw.tcp *	24-	6771-	TCP/IP Networking Support
	eeo2.sw.terminf	0	2629+	Terminal Information Utilities
	eeo2.sw.ts	0	29+	VME 1/4" Streaming Tape Support
i X	eeo2.sw.uds *	0	0	UNIX Domain Socket Support
	eeo2.sw.uucp	0	2210+	UUCP Utilities
i X	eeo2.sw.vadmin *	753-	5054+	Visual System Administration Interface

	eeo2.sw.xm	0	49+	Xylogics 1/2" Tape Support
	motif_eoe.man.eoe *	0	232+	Window Manager Manual Pages
	motif_eoe.man.eoemansrc	0	186+	Window Manager nroff Manual Pages
i	motif_eoe.man.relnotes *	0	40+	Release Notes
	motif_eoe.sw.eoe *	0	2817+	Motif Execution Software
	motif_eoe.sw.mwm	0	799+	Motif Window Manager
i	showcase.man.relnotes *	0	34+	Showcase Release Notes
	showcase.man.showcase *	0	6+	Showcase Manual Pages
i	showcase.sw.images *	0	35+	Showcase Images
i	showcase.sw.models *	0	1212+	Showcase 3D Models
i	showcase.sw.onlinehelp *	0	8438+	Showcase Online Help
i	showcase.sw.showcase *	0	5501+	Showcase Software
i	showcase.sw.templates *	0	356+	Showcase Templates
i	showcase.sw.workspace *	0	44+	Showcase WorkSpace Support

Disk space summary (512-byte blocks):

Effect of install selections	6781-	31198+
Effect of remove selections	0+	0+
Installation overhead	17+	1302+
Net change in blocks	6764-	31461+
Blocks available	11340+	34823+

We've managed to get enough disk space from removing files and changing our installation selections so that we have enough room to install what we want.

```
Inst> go
MISSING PREREQUISITES
```

The following subsystems cannot be installed because prerequisite software is not installed and is not selected for installation. See "help prerequisite" for more information.

```
eeo2.sw.4Dwm
```

```
Requires:      motif_eoe.sw.eoe      version 1006000263 to 2147483647
```

```
Installation failed.
```

This error is telling us that in order to have *eeo2.sw.4Dwm* installed, we must have *motif_eoe.sw.eoe* installed as well. We can either select *motif_eoe.sw.eoe* for installation or remove *eeo2.sw.4Dwm*.

```
Inst> install motif_eoe.sw.eoe
```

We select *motif_eoe.sw.eoe* because we want a window manager, and we're ready to perform the installation.

Inst> go

```
Removing old versions of selected eoe1.sw subsystems
Installing new versions of selected eoe1.sw subsystems
Installing new versions of selected eoe.man subsystems
Installing new versions of selected motif_eoe.sw subsystems
Installing new versions of selected motif_eoe.man subsystems
Installing new versions of selected showcase.sw subsystems
Installing new versions of selected showcase.man subsystems
Removing old versions of selected eoe2.sw subsystems
Installing new versions of selected eoe2.sw subsystems
```

Installation and/or removal succeeded.
You can insert another tape or CD-ROM now.

We're ready to press the Eject button on the CD-ROM drive and insert another CD now or to go on to the next chapter and finish up the installation. Since we were short of disk space, we make a mental note to check the disk space again just prior to exiting *inst*. (When we're ready to exit *inst* from a Miniroot Installation we want to verify that we have about 1700 blocks free in the / file system so that there is room for the kernel reconfiguration that will happen after we give the quit command.)

Finishing Up Installation

This chapter is the last of three that give detailed directions for using inst. It explains how to exit inst and complete the installation by checking for changed configuration files.

Finishing Up Installation

This chapter is the third and last that describes the steps of the installation process. Exiting *inst* and modifying configuration files if necessary are covered here:

- Section 6.1, “Overview of Finishing Up Installation,” gives an overview of the tasks discussed in this chapter.
- Section 6.2, “Returning to IRIX and Finishing Up,” describes the process of confirming that you’ve installed what you intended, exiting *inst*, and returning to IRIX. It also explains when and how to terminate *cdinstmgr*(1) and modify configuration files.

Errors that can occur during this stage of installation are described in Section 8.5, “Problems While Finishing Up Installation.”

6.1 Overview of Finishing Up Installation

A flowchart of the process of finishing up installation is shown in Figure 6-1. The first step is to confirm that you’ve installed the software you planned to install and removed the software you planned to remove. After this check, you exit the *inst* program with the `quit` command. If configuration files have been affected by your installation, a message about changed configuration files is displayed.

What happens next depends on the installation method you’ve used. If you’ve used IRIX Installation, you get a shell prompt. If you’ve used Miniroot Installation, you are asked if you are ready to restart your workstation. If you answer **yes**, your workstation is rebooted. You see the

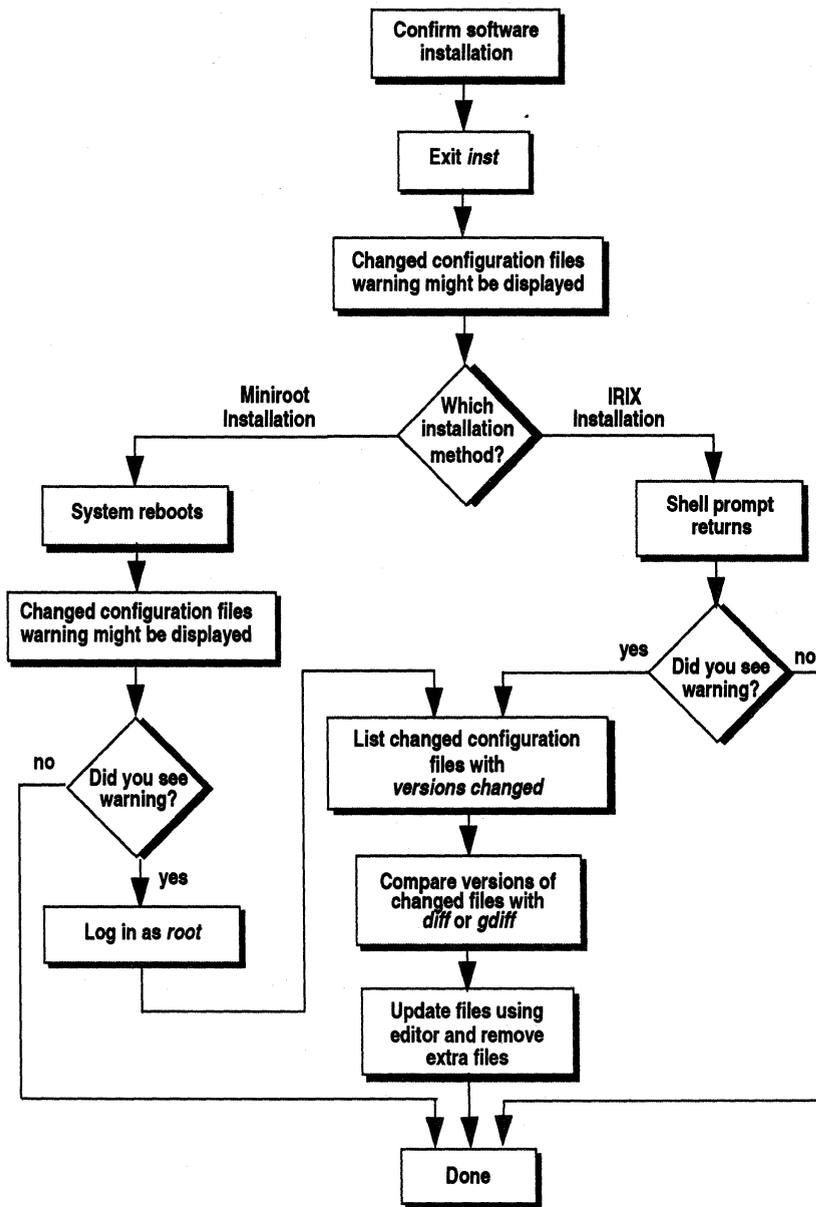


Figure 6-1 Finishing Up Installation Flowchart

screen change a number of times and then a login prompt appears. During this rebooting sequence, you might see a second message about changed configuration files. If you do not see this message, your software installation is complete.



If you see a configuration file message, you must merge changed configuration files in order to complete your installation. This message will be displayed the next 13 times you reboot your workstation unless you merge the configuration files.

To identify changed configuration files that need merging, use the IRIX command:

```
# /usr/sbin/versions changed
```

Configuration files can have three variants: current, older, and newer. The variants are identified by their file name suffixes: no suffix, *.O*, and *.N* respectively. After installation, you'll have a current version (variant) of each configuration file, and possibly a *.O* or *.N* version, but not both.

.O, or older, configuration files are older than their no suffix counterparts. *.O* configuration files are created when the new version is required for proper operation of your workstation and you had made modifications to the old version. Rather than attempting an automatic merge of local changes into the new version of the file, *inst* just renames the old version by adding the suffix *.O* to the name and installs the new version with no suffix.

When a *.N*, or newer, configuration file exists, it is the newest version of the configuration file. It was installed with *.N* appended to its name and the no suffix version was left unchanged. It was installed as a *.N* file because the no suffix version contains local modifications. The *.N* version has new features that you can merge into your current version if you want them.

Merging configuration files is usually done by comparing the files with *diff(1)* or *gdiff(1)*, making changes to one of the versions with a text editor, and moving or removing the *.O* or *.N* version.

If you've used remote CD-ROM as your distribution source, you need to terminate the *cdinstmgr* program that's been running on the remote workstation.

6.2 Returning to IRIX and Finishing Up

In this section, the steps for confirming your software installation, exiting from *inst*, terminating *cdinstmgr* (if used), and merging configuration files (if necessary) are described.

1. To confirm your installations and removals, give the *versions* command from the Inst Main Menu:

```
Inst> versions
```

The output of this *versions* command shows one line for each subsystem that is installed on your workstation. Review this list and check the following items:

- Confirm that the software you intended to install is present in the list.
- Look at the dates in the third column to make sure that everything you think you installed today has today's date.
- Make sure that any software that you intended to remove does not appear in the list.

Section 10.6, "versions Output," gives more information about how to interpret this output. If you find that the list doesn't confirm what you expected, you'll need to continue to use *install*, *remove*, *keep*, and/or *step* followed by the *go* command, until you are satisfied with the subsystems installed on your workstation.

2. If you are using Miniroot Installation and you have very little free disk space, display the amount of free disk space with the *space* command (shown below using a shortcut):

```
Inst> admin space
```

About 1700 blocks is needed in / for kernel reconfiguration. If the second to last line (Blocks available) shows less than 1700 blocks free disk space in /, you need to free up disk space so that at least 1700 blocks are available. Several techniques for freeing disk space are demonstrated in Section 5.7, "Sample Session 3."

3. Exit the *inst* program with this command:

```
Inst> quit
```

At this point, *inst* may print this message and dots to indicate its progress:

```
Running exit commands
```

Some minutes may pass while *inst* performs exit tasks (auxiliary commands) that must be done after all installations are completed. During this period, a message may be displayed that indicates that configuration files have been changed. If you are using the IRIX Installation method, the next thing you see is an IRIX shell prompt.

4. If you are using the Miniroot Installation method, you see this message and are prompted:

```
Please wait ...
```

```
Ready to restart the system. Restart? [y, n]
```

Reply **y** or **yes** to this question and the reboot process begins. During this process, the screen clears several times as IRIX is booted and the window manager comes up. You may see another message about changed configuration files.

5. If you used the Miniroot Installation method, log in to your system. If you saw the changed configuration files message, become the superuser.
6. If you used remote CD-ROM as your distribution source, *cdinstmgr* is still running on the remote workstation. Type "quit" at the prompt:

```
CD on <CDdir> for host <hostname>: type the word "done" when you are finished  
with this CD, "quit" if you are completely done: quit
```

7. You may see this message from *cdinstmgr*:

```
CD on <CDdir> for host <hostname>: the CD-ROM daemon was started by you,  
leave it running? (y/n)
```

If you answer **y**, the CD will not be ejected and *cdromd(1M)* (which was started by *cdinstmgr*) will not be killed. If you answer **n**, *cdinstmgr* attempts to eject the CD and kill *cdromd*. If the CD is in use, this message will be printed and the CD will not be ejected:

```
<CDdir>: Device or resource busy
```

8. If you want to eject a local CD, or if you used remote CD-ROM and the CD hasn't been ejected yet, give the *eject(1)* command on the workstation with the CD-ROM drive:

```
% eject
```

If the CD is in use, this command will fail with the message in the previous step and the CD won't be ejected.

9. If you did not see any messages about changed configuration files, your installation is complete. If you saw one or two messages about changed configuration files, continue with next steps.
10. To find out which configuration files have *.O* or *.N* versions, give this *versions* command:

```
# /usr/sbin/versions changed
```

Figure 6-2 shows sample output from **versions changed**.

Configuration Files

```
m      = modified since initial installation
?      = modification unknown
blank = file is as originally installed

/etc/halt
? /etc/halt.O (.O = old version, saved for comparison)
m /etc/passwd
  /etc/passwd.N (.N = new version containing suggested changes)
  /etc/reboot
? /etc/reboot.O
m /etc/services
  /etc/services.N
  /usr/etc/inetd.conf
? /usr/etc/inetd.conf.O
m /usr/lib/sendmail.cf
  /usr/lib/sendmail.cf.N
m /usr/sysgen/master.d/kernel
? /usr/sysgen/master.d/kernel.O
  /usr/sysgen/system
? /usr/sysgen/system.O
  /usr/sysgen/system.dl
? /usr/sysgen/system.dl.O
```

Figure 6-2 Sample *versions changed* Output

The *.O* versions of the configuration files are your earlier versions. In this case, the no-suffix version contains changes that are required for compatibility with the rest of the newly installed software, that increase functionality, or that fix bugs.

The *.N* versions of the configuration files are the versions from the newly-installed release. They contain changes or new features that can be added to the no-suffix version of the configuration file at your option.

The *Release Notes* for the products you install may have information about the changes that were made to configuration files in the new release.

11. Use *diff* or *gdiff* to compare *.O* files and their no-suffix counterparts and transfer information that you recognize as machine or site-specific from the *.O* version to the no-suffix version.
12. Similarly, compare the *.N* and their no-suffix counterparts and add changes that appeared in the new software from the *.N* version to the no-suffix version if you want them.
13. Delete the *.O* and *.N* versions of the configuration files. If you want to keep them, you should rename them since they might be removed automatically during the next software installation. When you remove all of the *.O* and *.N* configuration files, no message about configuration files appears when you restart your workstation, and the start up process will be faster.

You've completed the installation process.

Tips, Tricks, and Advanced Features

This chapter is a collection of procedures for system administrators, shortcuts for knowledgeable users, and information about configuring the user interface of inst.

Tips, Tricks, and Advanced Features

This chapter contains information about using *inst* that can be very helpful to you if you are interested in learning some *inst* shortcuts or becoming proficient at using *inst*. All of the basic information for using *inst* in typical situations is presented in other chapters. The topics in this chapter are ordered roughly according to the order in which you would encounter them during an installation.

7.1 Loading the Miniroot from the Command Monitor

The procedure below explains how to load the miniroot from local tape, local CD-ROM, remote tape, remote tape, or remote distribution directory using Command Monitor commands. (Loading the miniroot from a local distribution directory is not possible).

Follow these steps to copy the miniroot to the swap partition and invoke *inst*:

1. If you are using tape or CD, insert the tape or CD into the drive you plan to use.
2. Determine your workstation's CPU type (<cpu>), using one of the commands in Section 7.2, "Getting the CPU Type of a Workstation."
3. Look up your CPU type and distribution source in Table 7-1 and find a letter. This letter indicates the Command Monitor commands for your installation in Table 7-2. Local CD-ROM is not supported for IP4. Also, local CD-ROM is not supported for IP5, IP7, and IP9 workstations that have a "twin-tower" main unit.

<i><cpu></i>	Local Tape	Local CD-ROM	Remote Tape	Remote CD-ROM	Remote Distribution Directory
IP4	A	N/A	F	H	J
IP5, IP6, IP7, IP9	A	C	F	H	J
IP12, IP17	A	D	F	H	J
IP19, IP20, IP22	B	E	G	I	K

Table 7-1 Miniroot Installation Procedures

Procedure	Commands
A	<pre>>> setenv tapedevice <device>(<cntl>,<unit>) >> boot -f \$tapedevice(sash.<cpu>) --m</pre>
B	<pre>>> setenv tapedevice <device>(<cntl>,<unit>) >> boot -f \$tapedevice(sashARCS) --m</pre>
C	<pre>>> dksc(<cntl>,<unit>,8)sash.<cpu> -m</pre>
D	<pre>>> dksc(<cntl>,<unit>,8)sash<cpu> -m</pre>
E	<pre>>> dksc(<cntl>,<unit>,8)sashARCS -m</pre>
F	<pre>>> setenv tapedevice bootp(<server>:<tapedevice>) >> boot -f \$tapedevice(sash.<cpu>) --m</pre>
G	<pre>>> setenv tapedevice bootp(<server>:<tapedevice>) >> boot -f \$tapedevice(sashARCS) --m</pre>
H	<pre>>> setenv tapedevice bootp(<server>:<CDdir>/dist/sa) >> boot -f \$tapedevice(sash.<cpu>) --m</pre>
I	<pre>>> setenv tapedevice bootp(<server>:<CDdir>/dist/sa) >> boot -f \$tapedevice(sashARCS) --m</pre>
J	<pre>>> setenv tapedevice bootp(<server>:<distdir>/sa) >> boot -f \$tapedevice(sash.<cpu>) --m</pre>
K	<pre>>> setenv tapedevice bootp(<server>:<distdir>/sa) >> boot -f \$tapedevice(sashARCS) --m</pre>

Table 7-2 Command Monitor Commands to Load the Miniroot

4. Look up your letter in Table 7-2. One or two Command Monitor commands are listed. The commands have several variables. Each variable is listed in Table 7-3 along with the Section and Step where you can find the details of obtaining the value of the variable. Find the value of each variable in the Command Monitor commands for your letter.

Variable	Value	Procedure
<server>	The name of the remote workstation	Section 4.6 Step 3
<distdir>	The pathname of the distribution directory	Section 4.7.6 Step 4
<CDdir>	The pathname of the remote CD-ROM mount point directory	Section 4.6 Step 10
<localIPaddress>	The IP address of your workstation	Section 4.6 Step 6
<IPaddress>	The IP address of the remote workstation	Section 4.6 Step 5
<cpu>	The CPU type of your workstation	Section 7.2
<cntlr>	The controller number of the local tape or CD-ROM drive	Section 7.3
<unit>	The unit number of the local tape or CD-ROM drive	Section 7.3
<device>	The device type of the local tape drive	Section 7.4 Steps 1, 2
<tapedevice>	The pathname of a byte-swapped tape device on the remote workstation	Section 7.4 Steps 1 through 4

Table 7-3 Information Needed for Miniroot Installation Using the Command Monitor

5. If you are doing a remote installation, follow the steps in Section 4.6, "Preparing for Installing from a Remote Distribution Source."
6. Shut down your workstation and get to the Command Monitor.
7. If you are doing a remote installation, set the *netaddr* NVRAM variable if you have never set it or if your workstation's IP address has changed (you can check the current value with *printenv*):


```
>> setenv netaddr <localIPaddress>
```
8. Give the Command Monitor commands listed in Table 7-2 for your letter.

9. If both a tape drive and a CD-ROM drive are installed on your workstation, a message with a list of devices similar to this may appear:

Select device for installation:

1 - tape <device> (<cntl>, <unit>)
2 - CDROM dksc (<cntl>, <unit>, 8)

which?

Respond with the number of the tape or CD-ROM drive you want to use.

10. During the next ten minutes or so, you see these messages as the miniroot is loading and *inst* is invoked:

Copying installation program to disk.

.....
(some rows of dots appear)

IRIX Release <version> <cpu> Version <longversion> System V

ipg0: missing
enp0: missing
fxp0: missing

(these missing messages are normal and do not indicate a problem; one line appears for each type of device supported by the kernel, but not used on your workstation)

Creating miniroot devices, please wait...

The system is coming up. Please wait.
The system is ready.

Current system date is <date>

Mounting file systems:

<root_device> on /root
/root/dev/usr on /root/usr

Default location of new software is <source>

If you are a first-time inst user, give the command "help beginner".

(Inst Main Menu appears)

7.2 Getting the CPU Type of a Workstation

These commands can be used to find out the CPU type (*<cpu>*) of a workstation:

- *uname*(1)

This command prints the CPU type of the workstation:

```
% /bin/uname -m
```

- *hinv*(1M)

This command prints information about your processor:

```
% /bin/hinv -c processor
```

The CPU type is in the first line of output. It is IP4, IP5, IP6, IP7, IP9, IP12, IP17, IP19, IP20, IP22, or R2300.

- *hinv* from the Command Monitor

Give this command in the Command Monitor:

```
>> hinv
```

The first line of output contains the CPU type, which is IP4, IP5, IP6, IP7, IP9, IP12, IP15, IP17, IP19, IP20, or IP22. Some examples are:

```
CPU board: 1 IP7 33 MHZ
System: IP22
```

If the CPU type shown by *hinv* is IP15, your CPU type is actually IP7. If you got an error message from this command, *hinv* is not available in the PROMs on your workstation. In this case your CPU type is probably IP4.

7.3 Getting Controller and Unit Numbers for CD-ROM Drives

Some installation procedures described in Section 7.1, "Loading the Miniroot from the Command Monitor," require you to specify the controller, (*<cntl>*) and unit (*<unit>*) numbers for tape drives or CD-ROM drives. This section explains how to use *hinv* to get these numbers.

There are two versions of the *hinov* command:

- IRIX *hinov*

From IRIX, give this *hinov* command:

```
% /bin/hinov
```

The output you get will look similar to Figure 7-1. The *<unit>* and *<cntl>* numbers are shown on the "CDROM" line.

```
1 33 MHZ IP12 Processor
FPU: MIPS R2010A/R3010 VLSI Floating Point Chip Revision: 4.0
CPU: MIPS R2000A/R3000 Processor Chip Revision: 3.0
On-board serial ports: 2
Data cache size: 32 Kbytes
Instruction cache size: 32 Kbytes
Main memory size: 32 Mbytes
Integral Ethernet: ec0, version 0
CDROM: unit 4 on SCSI controller 0
Tape drive: unit 3 on SCSI controller 0: DAT
Disk drive: unit 1 on SCSI controller 0
Integral SCSI controller 0: Version WD33C93A, revision 9
Iris Audio Processor, rev 3
Graphics board: LG1
```

Figure 7-1 Sample IRIX *hinov* Output

- PROM Monitor *hinov*

From the Command Monitor, give this *hinov* command:

```
>> hinov
```

The output you see is similar to the example in Figure 7-2 (an error message from this command means that *hinov* is not available in the PROMs on your workstation). The *<cntl>* is the first number in parenthesis and the *<unit>* is the second. In this example, the CD-ROM *<cntl>* is 0 and the *<unit>* is 4. The tape drive controller is 0 and the unit is 2.

```
System: IP22
Processor: R4000 50 Mhz, with FPU
Primary I-cache size: 8 Kbytes
Primary D-cache size: 8 Kbytes
Secondary cache size: 1024 Kbytes
Memory size: 32 Mbytes
Graphics: GU1-Extreme
SCSI Disk: scsi(0)disk(1)
SCSI Tape: scsi(0)tape(2)
SCSI CDROM: scsi(0)cdrom(4)
Audio: Iris Audio Processor: version A2 revision 0.1.0
```

Figure 7-2 Sample PROM *hinv* Output

With other versions of PROMs, CD-ROM drives may appear either of these ways:

```
SCSI CDROM: dksc(0,4)
SCSI Disk: dksc(0,4)
```

The controller is the first number and the unit is the second number.

With other versions of PROMs, tape drives may similar to this:

```
SCSI Tape: tpsc(0,2)
```

Again, the controller is the first number and the unit is the second number.

7.4 Choosing Tape Device Names

If you install software from tape on a workstation that has more than one tape drive of any type, you must ensure that the PROM Monitor (if you are using Miniroot Installation) and *inst* access the correct tape drive. This section describes how tape drive device names are used and how to construct tape device names for the tape drive you want to use.

In order to read Installation Tools from a tape while in the PROM Monitor, the tape device name you specify must be a fixed block size, rewind, byte-swapped device. For more information on tape devices see *mtio(7)*.

By default, IRIX is configured so that if there is one 1/4-inch cartridge tape drive on a workstation, */dev/tape* is linked to the fixed block size, rewind, byte-swapped device for that tape drive. The following list describes when */dev/tape* is used by the PROM Monitor and how to specify other tape devices.

- If just one tape drive is connected to your workstation, the PROM Monitor uses */dev/tape* when you load the miniroot from a local tape using item 2 on the System Maintenance Menu.
- If more than one drive (tape and/or CD-ROM) is connected to your workstation and you use item 2 on the System Maintenance Menu, the PROM Monitor displays a menu and prompt you for the tape drive you want to use.
- You can specify the device name, *<device>*, controller, *<cntl>*, and unit, *<unit>*, of a tape drive on your workstation. To do this, you must use the procedure for invoking *inst* given in Section 7.1, "Loading the Miniroot from the Command Monitor."
- If you are using a tape drive on a remote workstation and item 2 on the System Maintenance Menu (Install System Software), the device */dev/tape* on the remote workstation is used by default. For some versions of PROMs, you can use 2 only if the device */dev/tape* is used. With these PROMs, you must use the Command Monitor (item 5) instead.
- If you are using a tape drive on a remote workstation and following the procedure for invoking *inst* given in Section 7.1, you can use *"/dev/tape"* or the device name *<tapedevice>* discussed below.

When you are invoking *inst* from IRIX using the *-f* option, or you are giving the *from* command, *inst* expects a fixed block size, no-rewind, byte-swapped tape device. You can specify tape device names as follows:

- If you use the shorthand name of "tape" and a tape drive on either your workstation or a remote workstation, *inst* uses the tape device that is linked to */dev/nrtape* on that workstation.
- You can use the device name *<nrtapedevice>* to access a tape drive on your workstation or a remote workstation.

The procedure below describes how to perform several tasks:

- Get the *<device>*, *<cntl>*, and *<unit>* of a tape drive
- Construct the device names *<tapedevice>* and *<nrtapedevice>* for a tape drive
- Figure out if the tape drive you want to use is already linked to */dev/tape* and */dev/nrtape*
- Link the tape drive you want to use to */dev/tape* and */dev/nrtape* so that you can take advantage of item 2 in the System Maintenance Menu and the “tape” shortcut in *inst* (it’s a good idea to link both names if you plan to use either)

To perform any of the tasks, start at the beginning of the procedure and do each step until you’ve accomplished the task you’re interested in.

1. Give the *hinv(1M)* command to find out the *<device>*, *<cntl>*, and *<unit>* of the tape drive you want to use:

```
% /bin/hinv
```

In the output, look for lines that begin with “Tape drive”. They will be similar to this:

```
Tape drive: unit 2 on SCSI controller 0: QIC 150
```

2. Figure out which line of output applies to the tape drive you want to use. Note the unit number, *<unit>*, the type (SCSI or ISI), and the controller number, *<cntl>*. In this example, *<unit>* is 2, the type is SCSI, and *<cntl>* is 0. If the type is SCSI, *<device>* is “tpsc” and if the type is ISI, *<device>* is “tpqic”.
3. If the drive type is SCSI, the device name *<tapedevice>* is:

```
/dev/mt/tps<cntl>d<unit>
```

and the device name *<nrtapedevice>* is:

```
/dev/mt/tps<cntl>d<unit>nr
```

For more information on constructing these device names, see *tps(7)*.

4. If the drive type is ISI, the device name *<tapedevice>* is:

```
/dev/mt/ts<cntl>d<unit>
```

and the device name *<nrtapedevice>* is:

```
/dev/mt/ts<cntl>d<unit>nr
```

For more information on constructing these device names, see *ts(7)*.

5. To see if *<tapedevice>* is already linked to */dev/tape*, give these two *ls(1)* commands (shown with sample output):

```
% ls -l /dev/tape
crw-rw-rw- 1 root sys 23, 64 Jul 19 09:37 /dev/tape
% ls -l <tapedevice>
crw-rw-rw- 2 root sys 23, 64 Sep 9 16:59 /dev/mt/tps0d2
```

Compare the major and minor device numbers in the fifth and sixth columns (23 and 64, respectively). If they are the same, as they are in this example, then the tape drive you want to use is already linked to */dev/tape* and you can use item 2 on the System Maintenance Menu.

6. To see if *<nrtapedevice>* is already linked to */dev/nrtape*, give these two *ls* commands (shown with sample output):

```
% ls -l /dev/nrtape
crw-rw-rw- 1 root sys 23, 65 Jul 19 09:37 /dev/nrtape
% ls -l <nrtapedevice>
crw-rw-rw- 2 root sys 23, 65 Sep 9 16:59 /dev/mt/tps0d2nr
```

Compare the major and minor device numbers in the fifth and sixth columns (23 and 65, respectively). If they are the same, as they are in this example, then the tape drive you want to use is already linked to */dev/nrtape* and can be referred to in *inst -f* arguments and from commands as "tape".

7. To link the tape device *<tapedevice>* to */dev/tape*, give these commands:

```
# rm /dev/tape
# ln <tapedevice> /dev/tape
```

8. To link the tape device *<nrtapedevice>* to */dev/nrtape*, give these commands:

```
# rm /dev/nrtape
# ln <nrtapedevice> /dev/nrtape
```

7.5 Specifying the Distribution Source on the Command Line

When you are doing an IRIX Installation, you can use the *inst* command line option `-f` to specify your distribution source. This is equivalent to giving the `from` command at the Inst Main Menu. The command has two forms:

```
# /usr/sbin/inst -f <source>
# /usr/sbin/inst -f <source>/<product>
```

where `<source>` is the software distribution source and `<product>` is a product name. (The form `<source>/<product>` cannot be used if `<source>` is a tape device.) These arguments to `-f` have the same syntax as some of the possible arguments to the `from` command. Section 10.2, "from Arguments," explains the syntax of these arguments.

7.6 Installing Software Noninteractively

It is possible to install software without using the *inst* menus when you are using IRIX Installation and installing the subsystems selected by *inst*. Basically this means that if an older version of the software is already installed, you get new versions of the currently installed software. If it's not already installed, you get the default subsystems (they are marked with * in `list` output). See Section 5.1, "Overview of Using *inst*," for a more complete discussion of *inst*'s selection algorithm.



To install software noninteractively, give the `-a` option on the *inst* command line. Typically you give the `-f` option, too, in order to specify the location of the software distribution. If you do not use the `-f` option, the default is the software distribution source that you used last when you last used *inst* (the value of the `set` option `dist`).

In the example below, the *ftn* product is installed noninteractively from a software distribution directory on a remote workstation.

```
% /bin/su -
Password:
# /usr/sbin/inst -a -f bigserver:/d/4D1-4.0/ftn
#
```

7.7 Using Command Name Shortcuts

You can always enter the commands that you see on the current menu at a menu prompt, but several useful shortcuts are described below that you can also use.

7.7.1 Giving Commands by Number

Instead of command names, you can give command numbers at the prompt. For instance,

```
Inst> 2
```

is the same as entering **list**.

7.7.2 Abbreviating Command Names

You need not type whole command names; the shortest unique prefix will do. An example is:

```
Inst> v -a
```

This command is the same as **versions -a**.

7.7.3 Displaying Hidden Commands

At each menu, several commands are available but not normally displayed. You can force them to be displayed with this command:

```
Inst> set fullmenu on
```

On the Inst Main Menu, these hidden commands are **set**, **sh**, and **shroot**. On the Administrative Commands Menu, the hidden commands are **help** and **quit**. On the Interrupt/Error Menu, **set** is a hidden command.

7.7.4 Giving Commands on Other Menus



From the Inst Main Menu, you can give commands on the Administrative Commands Menu without switching menus. To do this, enter **admin** and the command that you want at the Inst> prompt. For example:

```
Inst> admin date  
Wed Feb 24 22:58:53 PDT 1993  
Inst>
```

You can also give Inst Main Menu commands from the Administrative Commands Menu without switching menus. To do this, enter **return** and the command that you want at the Admin> prompt. For example:

```
Admin> return remove ftn.man.relnotes  
Admin>
```

7.8 Specifying Subsystems

When you give subsystem name arguments, *<names>*, to commands, you can use shortcuts to simplify entering lists of names. They are described in the following sections.

7.8.1 Using Wildcards

inst accepts some shell-style wildcards in names:

- ? Matches one character.
- * Matches any combination of characters but applies only to the product, image, or subsystem portion of the name it is used in. In other words, * doesn't match characters in the entire subsystem name, just from the previous '.' (or the beginning of the name) to the next '.' (or the end of the name).
- [] Matches any enclosed characters or a range of characters separated by a dash.

Some examples of the use of these wildcards in *<names>* are:

eoel.sw.* All *sw* subsystems in *eoel*
.man. All *man* subsystems
***.man** All *man* images
eoel* All products whose names begin with *eoel* (*eoel* and *eoel* for example)
[a-c]*.sw.* All *sw* subsystems in products whose names begin with a, b, or c

7.8.2 Using Product or Image Names

Any command that takes subsystem names as arguments will also take product names or image names. This means that you don't have to give trailing *.** and *.*.** to get all of the subsystems in an image or all of the subsystems in a product, respectively. Some example commands with product and image arguments instead of subsystem arguments are:

```
Inst> list eoel  
Inst> install *.man  
Inst> keep *
```



You can always tell whether you are specifying a subsystem, image, or product name: product names have no periods, image names have one period and subsystem names have two periods. This rule is true even when *** wildcards are used.

7.8.3 Using Keywords



Keywords are a convenient way to specify groups of subsystems. They are word or letter arguments to the `list`, `install`, `remove`, `keep`, and `step` commands that are shorthand for subsystems that have certain installation status characteristics. The complete list of keywords is specified in Table 10-7. An easy way to remember some of the keywords is to remember that all of the installation status letters that you see in the first two columns of `list` output are keywords that you can use. For instance,

```
Inst> install X
```

means select for installation all of the subsystems in the distribution that have older versions currently installed.

```
Inst> keep i
```

means take no action on subsystems that have an `i` next to them (erase every `i`, in other words).

```
Inst> remove N
```

means remove the subsystems that have newer versions installed than the version available in the software distribution.

7.9 Controlling Menu Displays

When you switch menus, `inst` displays the new menu by default. The menus show only a subset of the commands that can be entered at the prompt. The following sections tell you how to change this default behavior.

7.9.1 Turning Off Menu Displays

If you don't want menus displayed when `inst` first comes up and when you switch menus, give this command at any prompt:

```
Inst> set menus off
```

Any time you want to see the current menu, you can press **<Enter>** or give the **?** pseudo-command as discussed in Section 7.9.3. You can change back to the default behavior with:

```
Inst> set menus on
```

The value of `menus` is saved in your installation history database, so you do not need to change the value of `menus` every time you use `inst` if you do not like the default value.

7.9.2 Showing All Menu Commands

If you want the menus to list all commands available at the prompt, use the `set` command at any prompt:

```
Inst> set fullmenu on
```

To switch back to the default behavior, give this command at any prompt:

```
Inst> set fullmenu off
```

Your choice of `on` or `off` is remembered in your installation history database, so you don't need to change `fullmenu` to `on` each time you use `inst`.

7.9.3 Redisplaying the Menu

Since `inst` doesn't redisplay the current menu after each command you give, you may want to look at the current menu but find it's not on your screen. The current menu is displayed if you press **<Enter>** or give the pseudo-command **?**. (It's a pseudo-command because it never appears on menus.) For example:

```
Inst> ?
```

```
Inst Main Menu  
...
```

```
Inst>
```

7.10 Setting the Window Configuration

The default window configuration is:

- When you are using Miniroot Installation, the window height is 40 lines or 24 lines, depending on the size of your monitor (24 lines if *inst* can't determine the size of your monitor). If you are using IRIX Installation, *inst* sizes itself to your window.
- The window width is 80 if you are using Miniroot Installation or the width of your window if you are using IRIX Installation.
- In *list*, *versions*, and *files* output, lines that are longer than the value of the *set* option *columns* (default 80) are wrapped or truncated as specified by the *set* option *wrapmode* (default is to wrap). (Output of the *step* command is always truncated at 80.)
- When the output you request from *list*, *versions*, *files*, and a few other commands is longer than the number of lines in the window is paused after it fills the window and a "more?" prompt is displayed. Feedback from *inst* that is peripheral to your request is not paused.

Three *set* options described below give you some control over window size in lines and columns, the display of lines that are longer than the number of columns in your window, and the display of output that has more than one screenful of lines.

7.10.1 Lines

The *set* option called *lines* is useful in three situations:

- *inst* incorrectly determined the number of lines in the window it is being run in (this might happen if you are using an ASCII terminal it doesn't recognize).
- You've changed the window size.
- You want to disable the pausing behavior when output is longer than a screenful.

To tell *inst* the number of lines in the window, give this command at any prompt:

```
Inst> set lines <number>
```

where *<number>* is the number of lines in the window.

To tell *inst* to let long output scroll off the top of the screen rather than giving the *more?* prompt, give this command at any prompt:

```
Inst> set lines 0
```

7.10.2 Columns

You can use the `columns` option of the `set` command to tell *inst* how many columns of output to display. Changing the value of `columns` is probably useful only when you are using IRIX Installation and you've changed your window size after invoking *inst*. The command to change the `columns` value is:

```
Inst> set columns <number>
```

where *<number>* is the number of columns you want. This command can be given at any prompt.

7.10.3 Display of Long Lines

You can tell *inst* to truncate command output lines that are longer than the value of the `set` option `columns` rather than wrap them with this command (from any prompt):

```
Inst> set wrapmode truncate
```

After you give this command, if the value of `columns` is more than the number of columns in the window, the output will be truncated at the `columns` number of characters, and then wrapped because the window is too narrow to display the truncated line.

You can return to no truncation of long lines with the command:

```
Inst> set wrapmode wrap
```

inst menus and messages will wrap if the number of columns in the window is less than 80 regardless of the setting of `columns` and `wrapmode`.

7.11 Controlling Disk Space Checks and Reports

When *inst* gives the message:

```
Computing disk space changes:
```

it is checking disk space usage: how much free disk space is available in the `/` and `/user` file systems (and others if others are mounted) and what the disk space usage change would be if all of the subsystems in the software distribution were installed. For subsystems that are already installed, the current size of every file is compared to its original size to see if any files were deleted and to see how much configuration files have grown in size because of local modifications.

Disk space checking enables *inst* to make reasonably accurate predictions about whether or not disk space on your workstation is sufficient for what you want to install. It also provides you with disk space information that helps you make choices about what to install and remove if disk space is limited.

By default, disk space checking is done every time there is a new software distribution (when *inst* first comes up and after every `from` command) and you give a `list` or `step` command. Disk space summary information is displayed by default at the end of the output from `list` and `step` commands (the summary is not displayed if you press `q` at a `more?` prompt).

The sections below describe ways you can change this default disk space checking and reporting behavior.

7.11.1 Minimizing Disk Space Checking Time



When the CD or distribution directory you are using includes more than one product, and you want to install only one product, you can reduce the amount of time *inst* spends checking disk space in two ways:

- Install just one product at a time.

Use the *inst* command line option `-f` (see Section 7.5, “Specifying the Distribution Source on the Command Line”) or give a `from` command to tell *inst* to read just a single product from a distribution. These commands limit the disk space checking to the checking required for `<product>`, rather than all of the products in the distribution. The commands are:

```
# /usr/sbin/inst -f <source>/<product>
```

```
Inst> from <source>/<product>
```

```
Inst> from $dist/<product>
```

`<source>`, `<product>`, and `$dist` are described in Section 10.2, “from Arguments.” The `from` command must be given before a `list` or `step` command that triggers disk space checking. This shortcut does not apply to software distributions on tape.

- Set the `set` option `detailspacecheck` to `off`.

inst will do faster, but less accurate disk space checking if you give this command before you give your first `list` or `step` command:

```
Inst> set detailspacecheck off
```

inst saves the value of `detailspacecheck` in your installation history database, so you do need not give this command every time you invoke *inst* if you always want faster, less accurate disk space checking.

7.11.2 Delaying Disk Space Checking

One of the `set` options, `delayspacecheck`, gives you the ability to postpone disk space checking until after you give the `go` command. The drawback of delaying disk space checking is that you do not get disk space information while you select subsystems, but if you have plenty of disk space, it will speed up the interactive portions of installation sessions (at the expense of making the non-interactive portions longer since disk space checking is always done prior to the installation of subsystems).

To postpone disk space checking until you give the `go` command, give this command before you give your first `list` or `step` command:

```
Inst> set delayspacecheck on
```

`inst` saves the value of `delayspacecheck` in your installation history database, so you do not need to give this command every time you invoke `inst` if you always postpone disk space checking.

While `delayspacecheck` is on, you can request a disk space calculation and summary at any time by giving the `space` command on the Administrative Commands Menu:

```
Admin> space
```

To switch back to doing a disk space check after every `from` command, give this command:

```
Inst> set delayspacecheck off
```

7.11.3 Forcing Disk Space Recalculation

If you remove files from your workstation while you have escaped to a shell (used the `sh` or `shroot inst` commands followed by IRIX `rm(1)` commands), `inst` doesn't automatically update its disk space usage numbers. You must give the `recalculate` command from the Administrative Commands Menu in order to request that a new disk space check be done.

```
Admin> recalculate
```

7.11.4 Displaying the Disk Space Summary

Disk space summaries are displayed at the end of the output from `list` and `step` commands. If you want to get a summary without using `list` or `step`, you can give the `space` command from either menu:

```
Admin> space
```

```
Inst> admin space
```

This command does not force a recalculation of disk space, so if no disk space calculation has been done, the first two lines (effect of install and remove selections) will show 0 blocks, even if you have made installation or removal selections.

7.12 Controlling the Display of File Names

By default, *inst* does not report the names of files as it installs and removes them. Two `set` options described below allow you to turn printing of file names on and off, and a third `set` option controls how file names are displayed.

7.12.1 During Installation

To turn on the printing of file names as they are installed, give this command at any prompt prior to giving the `go` command:

```
Inst> set verbose on
```

To return to no printing of file names as they are installed, give this command at any prompt:

```
Inst> set verbose off
```

The value of `verbose` is saved in your installation history database, so it has the same value from one *inst* session to the next until you explicitly change it.

7.12.2 During Removal

The `set` option `verboserm` controls the display of file names as files are removed. To print file names when subsystems are removed, give this command at any prompt:

```
Inst> set verboserm on
```

This command turns off the display of file names:

```
Inst> set verboserm off
```

Like `verbose`, the value of `verboserm` is remembered from one *inst* session to the next.

7.12.3 Overprint vs. Scroll

When file names are printed during installation and removal, by default each name is printed "on top" of the previous one. To change the printing so that each name is printed on a new line, give this command:

```
Inst> set overprint off
```

To return to the default behavior, give this command:

```
Inst> set overprint on
```

These commands can be given at any prompt, and the value of `overprint` is saved in the installation history database so you need not reset it the next time you use *inst*.

7.13 Displaying the Current Distribution Source

The current distribution source is displayed in a message that is one of the first lines that appears after you invoke *inst*. The message has one of these two forms:

```
Default location of new software is <source>
```

```
Default location of new software is <source>/<product>
```

`<source>` is your current distribution source. Depending on your situation, it includes one or more of these items: a user ID, a remote workstation name, and a directory or tape device. `<product>` is a product name and appears if you've specified a product name with the `-f` option on the *inst* command line (IRIX Installation only). The complete syntax of `<source>` and `<source>/<product>` is given in Section 10.2.

Each time you give the `from` command, your current distribution source changes. At any time you can look up the current distribution source by giving the `set` command:

```
Inst> set
      Option      Value      Description
      ...
      dist         <last_source>
                        Most recent distribution source

Inst>
```

The last option in the list is the `dist` option. Its value is `<last_source>`. Its value is usually the same as `<source>`, your current distribution source, but there is one exception: after you invoke `inst`, but before product descriptions are read for the first time, the value of `dist` will be the distribution source you used the last time you used `inst`. If you are using a distribution source of the form `<source>/<product>`, note that `<product>` isn't included in the value of `dist`.

7.14 Turning Off Initial Selection of Subsystems

As discussed in the `from` section in Section 10.1, each time you invoke `inst` or give a `from` command, `inst` ignores any installation or removal selections that haven't been performed and uses its algorithms to select subsystems for installation. You can turn off this selection of subsystems by `inst`. Any pending installation or removal selections will still be erased.

To prevent `inst` from making selections after you give the `from` command and in the future when you invoke `inst`, give this command:

```
Inst> set autoselect off
```

Turning `autoselect off` means that the only `i` characters in the first column of `list` output will be ones that you put there yourself. You can turn automatic selection back on with this command:

```
Inst> set autoselect on
```

The value of `autoselect` is saved in your installation history database, so once you set it `off`, it is `off` in future `inst` sessions until you change its value to `on`.

7.15 Checking and Setting the System Date

The Administrative Commands Menu provides a convenient way to check and set the date on your workstation. It is important to have the correct date and time during installation because some portions of the installation process use `make(1)`, which relies on dates to determine if certain commands should be given. Having the correct date and time ensures that the actions that are sensitive to the dates of files are performed correctly.

The `date` command is identical to `date(1)`. This command prints the date:

```
Admin> date
```

The command to set the date is:

```
Admin> date <mmddhhmmyy>
```

where `<mmddhhmmyy>` is two characters each for month, day, hour (24-hour clock), minutes, and optional year.

7.16 Changing the Network Timeout Value

`inst` allows you to specify a network timeout value. This value is the length of time that `inst` waits for responses from a remote workstation before giving up.

The `set` command is used to display and set the timeout value as shown in this example:

```
Inst> set
      Option      Value      Description
      ...
      timeout     180        Network timeout, in seconds
      ...

Inst> set timeout 120
Inst>
```

A minimum value of 180 seconds is recommended. The value of `timeout` is saved in your installation history database, so once you find a value of `timeout` that works for your site, you won't need to set it again unless you get a timeout error.

7.17 Displaying the Files in a Subsystem

The `files` command on the Administrative Commands Menu displays the names of the files and directories in subsystems in the software distribution. When you're not sure whether you should install a subsystem or not, looking at its contents can help you decide. The command is:

```
Admin> files <names>
```

where <names> are one or more subsystem, image, or product names. The output of the `files` command is described in Section 10.7, "files Output."

To get a list of the files in an installed subsystem, use the `versions` command:

```
Inst> versions long <names>
```

The output of the `versions` command is described and an example is given in Section 10.6, "versions Output."

7.18 Listing Subsystem Sizes

The `list` command normally displays disk space usage information that tells you what the increase or decrease in disk usage would be if a subsystem were to be installed (subsystems marked `i`, `k`, or blank) or removed (subsystems marked `r`). If the `set` option `delayspacecheck` is `off`, you can give the keyword `sizes` with the `list` command to display the absolute sizes of subsystems in the software distribution. An example is:

```
Inst> list sizes motif_dev
...
Subsystem                /      /usr Description
motif_dev.man.dev *      0      3528+ Developer Manual Pages
motif_dev.man.devmansrc  0      2531+ Motif Developer nroff Manual
                          Pages
motif_dev.man.relnotes * 0       188+ Motif Release Notes
motif_dev.sw.demo        0      6038+ Motif Demos & Examples
motif_dev.sw.dev *      0      8385+ Motif Libraries & Headers
...
Inst>
```

7.19 Using Advanced `step` Features

The `step` command puts you in an interactive mode that enables you to make subsystem selections with single keystrokes. For the basic selection functions you can use several possible sets of keys with identical results. Some searching and listing capabilities are also included. The complete list of capabilities and the keys to press are given in Table 7-3. For several of the capabilities, you can choose from two or more keys that have identical results.

Request	Keys
Selection Requests That Apply to Subsystems	
Select for installation.	i <right-arrow>
Select for removal.	r
Keep current version and/or cancel current request.	k <left-arrow>
Select for installation if marked with * or already installed.	d
No change to current request.	n <down-arrow> + <Enter>
No change to current request, print previous subsystem next.	p <up-arrow> -
Selection Requests That Apply to the Current Product	
Select all subsystems for installation.	I
Select all subsystems marked with * for installation.	<shift-right-arrow>
Select all subsystems for removal.	R
Keep current version and/or cancel current request for all subsystems.	K <shift-left-arrow>
Select subsystems for installation if marked with * or already installed.	D
Retain current request for all subsystems.	N <shift-down-arrow>
Retain current request; print first subsystem of previous product next.	P <shift-up-arrow>-
Requests for Lists	
List all previous subsystems.	l
List the files in this subsystem.	f
Miscellaneous Requests	
Search for pattern <pattern>.	/<pattern><Enter>
Quit step mode.	q

Table 7-3 Requests in step Mode

7.20 Escaping to the Shell

While you are using *inst*, it is possible to invoke a shell, give shell commands, and then return to *inst*. The most common reason for this procedure is to remove user files in order to free up disk space. Two commands for invoking a shell are:

```
Admin> sh
Admin> shroot
```

The **sh** command gives you a regular shell and the **shroot** command gives you a *chroot*(1M) shell. By default, the shell that you get will be the value of the SHELL environment variable, typically */bin/sh* or */bin/csh*. If you want a different shell, you can use the **set** command to specify it:

```
Admin> set shell <shell_path>
```

When you use the **sh** command with Miniroot Installation, remember that your root and user file systems are mounted as */root* and */root/user*. If you use **shroot**, your root will be changed to */root*, so the change in pathnames will be transparent for most commands you give. Using **shroot** rather than **sh** is recommended, because you don't have to remember to preface file names with */root* when you use **shroot**.

If you are using Miniroot Installation, a small number of IRIX commands in the miniroot are available to you. You may or may not be able to use commands in */root* and */root/usr*. They might not be available there, and, even if they are, they may not be compatible with the miniroot kernel. If you are installing from a local distribution source, you cannot access any remote workstations. If you are using a remote distribution source, you can access the remote workstation that contains the distribution.

inst is not able transparently to update its disk space information when you add or remove files while using a shell. To update *inst*'s disk space information, give the **recalculate** command after returning to *inst*:

```
Admin> sh
# rm <files>
# ...
# exit
Admin> recalculate
```

7.21 Managing File Systems

inst provides three commands for mounting, unmounting, and making file systems that are subsets of the *mount(1M)*, *umount(1M)*, and *mkfs(1M)* commands. These commands are *mount*, *umount*, and *mkfs* on the Administrative Commands Menu, and they are described in the following sections.

7.21.1 Mounting File Systems

You can see what file systems are mounted by giving the *mount* command without arguments:

```
Admin> mount
```

If you are using Miniroot Installation, you can mount additional file systems with this command:

```
Admin> mount <file_system> <directory>
```

Remember that while you are in the miniroot, your file systems are mounted under */root* rather than *.*.

7.21.2 Unmounting File Systems

To unmount file systems, you must be using Miniroot Installation. The command is:

```
Admin> umount <file_system>
```

7.21.3 Making New File Systems



The *mkfs* command allows you to make file systems with *mkfs* if you are using Miniroot Installation. This command erases the entire contents of file systems, so it should be used with caution. You are prompted with the full *mkfs* command and required to confirm your command before the *mkfs* is actually done.

If the `mkfs` command is given without any arguments, the root and user file systems, `/` and `/usr`, will be erased and the file systems remade. In addition to losing all of the system and user files in these file systems, remaking the root and user file systems has these effects on your installation:

- All local information in configuration files is lost.
- You will be prompted for the IP address of the remote workstation if you are using a remote distribution source.
- All of the information in your installation history database is lost.

To make other file systems, give device name arguments to `mkfs`. For example:

```
Admin> mkfs <device>
```

See the `mkfs(1M)` manual page for more information about the argument `<device>`. In order to access the newly created file system, `<device>`, you need to have a directory mount point and the file system needs to be mounted:

```
Admin> shroot  
# mkdir <directory>  
# exit  
Admin> mount <device> <directory>
```

7.22 Removing All Software

You can remove all installed software from your workstation in two ways:

- Use the `mkfs` command.
- Use a combination of the `remove`, `go`, and `versions` commands.

In older versions of `inst`, a command called `clean` was provided. The function of `mkfs` when it is used without arguments is identical to the (now obsolete) `clean` command, but using `mkfs` is not recommended. It deletes all files, not just installed software, and it has the side effects listed in the previous section.

To remove all installed software using the `remove`, `go`, and `versions` commands, follow this procedure:

1. Give this command to select most subsystems for removal:

```
Inst> remove I
```

You will get warning messages about required subsystems and *maint* subsystems which can be ignored.

2. Perform the removal of most of the subsystems on your workstation with this command:

```
Inst> go
```

3. Get a list of the subsystems which were not removed with this command:

```
Inst> list I
```

4. Perform the removal of the remaining subsystems with this command:

```
Inst> versions remove <installed subsystems>
```

<installed subsystems> is the list of subsystems from the previous step.

When you remove subsystems with `remove` and `versions` commands, any configuration files that you have modified are not removed. This preserves local information you may have added. You can use the command `versions config` to get a list of these files.

7.23 Avoiding Compatibility Problems

Although some compatibility information is contained in the product descriptions that *inst* reads when it accesses a software distribution, *inst* allows you to install incompatible software in many situations. The list below contains guidelines for avoiding compatibility problems.

- *inst* tells you about incompatible subsystems when you try to install them with `go`. To learn about these incompatibilities earlier, check the *Release Notes* for the products you plan to install. These incompatibilities should be mentioned there.

- The subsystems of a product should all have the same release number. When in doubt, give the `versions` command with the `-n` argument from `inst` or the `versions(1M)` command with the `-n` option from IRIX:

```
Inst> versions -n <names>
```

```
% versions -n <names>
```

The column that usually contains date of installation contains a number instead. Look at the numbers and make sure that all of the subsystems within each product have the same number. If not, you have subsystems from two different releases installed and are likely to have a compatibility problem.

- When you receive a software update, install the new versions of all of the products you receive, not just some of them.
- If any of the subsystems you want to install require Miniroot Installation, perform all of your installations during one Miniroot Installation session in order to avoid potential incompatibilities as you switch from one installation session to another.
- If you install a new product or subsystem on your workstation and your workstation has a Maintenance Release installed on it, reinstall the Maintenance Release after you install the new product. You need not reinstall already installed *maint* subsystems, but there might be a *maint* subsystem for the new product or subsystem you just installed. As with all Maintenance Release installations, the recommended procedure is to use the `list` command to check the contents of the Maintenance Release, and then use the `go` command. Do not select subsystems manually with `install`, `remove`, `keep`, or `step`.
- If you are installing software from a CD, tape, or distribution directory that contains both Software Product Releases and Maintenance Releases, for example *nfs* and *maint_nfs*, select and install subsystems as usual. However, before quitting or switching to a different software distribution, give the `list` command and look for selected *maint* subsystems. If *maint* subsystems are selected (they were selected automatically because their base subsystems are now installed), install them by giving the `go` command.



7.24 Using the Miniroot for System Recovery

If you cannot boot IRIX on your workstation, you can still load the miniroot to get access to files on your workstation. Failure to boot can happen if critical files such as */unix* (the IRIX kernel) or */etc/passwd* (the file that contains user IDs and passwords) are removed from your workstation. While you are in the miniroot, you can access a local tape drive or CD-ROM drive. You can access a remote workstation only if you've loaded the miniroot from a distribution source on that workstation. You can access files on your workstation by escaping to a shell with the *sh* or *shroot* commands.

7.25 Creating Software Distribution Directories

For many sites, copying software distributions onto disk is a good way to make software distributions available to many workstations, to eliminate the need to share distribution tapes and CDs, and to speed up installations at sites where the transfer rate of a disk and the network is faster than other devices such as a tape drive. Of course, this distribution source, like all others, should be used only when the software has been purchased for the workstation it is to be installed on.



Distribution directories should not be created on “multi-homed” workstations (routers with more than one IP address) that will be used as a remote distribution source for other workstations. Packets sent to these workstations don't necessarily return to the sender by the same route and this can cause problems during Miniroot Installations.

To create a distribution directory from one or more software distribution tapes, use the *distcp(1M)* command. Complete instructions for using this command are contained in the *distcp(1M)* manual page.

To create a distribution directory from one or more CDs using a CD-ROM drive on any workstation, follow these steps:

1. On the workstation with the CD-ROM drive, become the superuser:

```
% /bin/su -  
Password:  
#
```

2. If the workstation where you want the distribution directory is different from the workstation with the CD-ROM drive, become the superuser on the workstation where you want the distribution directory, too.
3. Get the controller (<cntl>) and unit (<unit>) numbers for the CD-ROM drive using *hinv* as explained in 7.3, "Getting Controller and Unit Numbers for CD-ROM Drives."

4. If there is already a CD in the CD-ROM drive, eject it with this command on the workstation with the CD-ROM drive (you can omit the argument if there is just one CD-ROM drive on the workstation):

```
# /usr/sbin/eject /dev/scsi/sc<cntl>d<unit>10
```

(This command has a lower case L and a zero at the end of it.)

5. On the workstation where you want the distribution directory, create a directory for the distribution:

```
# /bin/mkdir <distdir>
```

6. On the workstation with the CD-ROM drive, kill the program *cdromd*(1M) which may or may not be running:

```
# cdromd -k /dev/scsi/sc<cntl>d<unit>10
```

7. Create a mount point directory called */CDROM* on the workstation with the CD-ROM drive, if it doesn't exist already:

```
# mkdir /CDROM
```

8. Insert the first CD you want to copy into the CD-ROM caddy with the label up and push the caddy into the drive.

9. Mount the CD on the workstation with the CD-ROM drive:

```
# /etc/mount -o ro /dev/dsk/dks<cntl>d<unit>s7 /CDROM
```

10. To copy the distribution, give a command on the workstation with the distribution directory. Use the first command if the CD-ROM drive is mounted on your workstation and the second command if the CD-ROM drive is mounted on a remote workstation:

```
# cp /CDROM/dist/* <distdir>
```

```
# /usr/bsd/rcp <user>@<server>:/CDROM/dist/* <distdir>
```

where <user> is "guest" or an appropriate user ID. See *rcp*(1) and *rhosts*(4) for more information.

11. Eject the CD with this command on the workstation with the CD-ROM drive (you can omit the argument if there is just one CD-ROM drive on the workstation):

```
# /usr/sbin/eject /dev/scsi/sc<cntl>d<unit>10
```

12. Start the CD-ROM daemon (which you may have killed in Step 6) by giving this command on the workstation with the CD-ROM drive:

```
# /usr/etc/cdromd -a
```

If you have more than one CD-ROM drive, you might get an error from this command, but you can safely ignore it.

You can create a software distribution directory that contains fewer products than are in the CD-ROM distribution by copying the files for just the products you want (see Section 8.2.6, “Checking Distribution Directories and CDs,” for a discussion of the files in software distributions; note that distribution directories and CD-ROM distributions have an identical format). For example, to copy just one product from a local CD-ROM drive, use this command:

```
% cp /CDROM/dist/<product>* <distdir>
```

You can copy several CDs into a single distribution directory. This simplifies the installation process for users because it is less interactive and because the order of installation of products is handled automatically by *inst*. However, it is not possible to put more than one release (version) of a product into a distribution directory. Different distribution directories must be created for different releases of a product. To copy several CDs, follow Steps 5 through 11 above for the first CD, insert the second CD into the CD-ROM drive, then repeat Steps 9 through 11. Repeat Steps 9 through 11 again for each additional CD you want to copy.

7.26 Copying Software Distributions onto Tapes

For many sites, copying software distributions onto tape is a good way to make software distributions available to many workstations and to eliminate the need to share distribution tapes and CDs. Of course, this distribution source, like all others, should be used only when the software has been purchased for the workstation it is to be installed on.

The *distcp*(1M) command is used to make distribution tapes. The syntax of the command is:

```
distcp [ -cnrsvw ] from to [ file ... ]
```

Some tips are:

- Distribution tapes must be created on a local tape drive.
- QIC 24 (15 and 60 MB) tapes can't be written on QIC 150 tape drives; they can be written on QIC 24 tape drives only.
- Copying software distributions to DAT and Exabyte tapes is not supported.
- Tape devices must be fixed block, byte swapped, no-rewind devices. Do not use tape device names with *v* in them. See the instructions for creating *<nrtapedevice>* device names in Section 7.4, "Choosing Tape Device Names."
- You must be superuser to copy from a tape, CD, or distribution directory on a remote workstation.
- To create a distribution tape that you can use to do Miniroot Installations, the files *sa* and *mr* must be included on the tape. If you are creating a distribution tape from a distribution directory, make sure that both these files are in the distribution directory. If *mr* is missing, create a 0 length file in the distribution directory with the name *mr*.
- By default, the files *sa* and *mr* are copied if present in the distribution you are copying. To prevent the copying of *sa* and *mr*, use the *-n* option.
- To get verbose output, use the *-v* (verbose) and *-w* (warnings) options.
- To make distribution tapes of one or more specific products rather than all products in the distribution you are copying, list each product at the end of the command line using this syntax:

```
"product*"
```
- When you install software from a distribution tape, use a fixed block, byte swapped, rewind tape device.

Some examples of *distcp* commands that create tapes are:

- Copy an entire 1/4-inch distribution tape from a remote tape drive to the local 1/4-inch tape drive (no verbose output, tape drives are linked to */dev/nrtape*):

```
# distcp machine:/dev/nrtape /dev/nrtape
```

- Copy the miniroot, *ee1*, and *ee2* from a remote CD mounted at */CDROM* to a local tape drive (unit 3 on controller 0):

```
# distcp -vw machine:/CDROM/dist /dev/rmt/tps0d3nr "ee1*" "ee2"
```
- Copy *maint* products only from a distribution directory on the local workstation to a tape also on the local workstation:

```
% distcp -nvw /usr/4.0.5H/dist /dev/nrtape "maint*"
```

Installation Troubleshooting

This chapter provides diagnostic procedures to help you isolate and identify problems and lists many error messages with their possible causes and solutions.

Installation Troubleshooting

This chapter presents information and procedures that you can use to troubleshoot problems that you might encounter during installation.

Section 8.1, "Error Message Types," describes the four categories of error messages, error types in each category, and what to do about errors in general. If the error message you are getting does not appear in the lists of error messages later in this chapter, information in this section can give you some ideas on how to proceed.

Section 8.2, "Diagnostic Procedures," gives diagnostic procedures. It discusses techniques for getting more verbose output and specific procedures for testing network connections, verifying tape contents, and checking tape drive and network hardware. A list of environmental characteristics that must be present in order for any installation to succeed is given.

Sections 8.3, 8.4, and 8.5 list error messages you might encounter while following the procedures in Chapter 4, "Bringing Up *inst*," Chapter 5, "Using *inst*," and Chapter 6, "Finishing Up Installation," respectively. Section 8.6 lists problems other than error messages that you might encounter at any time during an installation session.

Finally, Section 8.7, "Calling Your Support Organization," gives the telephone number for the Silicon Graphics Technical Assistance Center and lists the information you should have handy if you call.

8.1 Error Message Types

Error messages during installation fall into four categories. Just knowing the category of an error message tells you a great deal about where the error is coming from and what you should do about it. The four categories are listed below with their names, an example, and a discussion.

- Errors that require user resolution

MISSING REQUIRED SUBSYSTEMS

The following subsystems are required for basic system functionality. They are not currently installed and are not selected for installation. See "help required" for more information.

One type of error message begins with a title in all capital letters, followed by a paragraph or more of discussion. These error messages indicate that you have made installation selections that *inst* is unwilling to perform. The discussion describes the problem and is as specific as possible about what you must do to resolve it. In many cases, the error message suggests you refer to an online help topic. You must resolve these errors before installation can proceed.

- Warnings

```
warning: unable to umount CD-ROM
```

```
eoel.sw.unix: r -> k because it is required for system operation
```

Warnings begin with either **warning:** or a subsystem name and a colon. They are single-line messages with a description of the problem and possibly a help reference. Warnings alert you to some condition that you may want to do something about. In all cases, installation can proceed even if you take no action.

- *inst* errors

```
inst: error in space calculation
```

Error messages of one line that begin with **inst:** indicate that *inst* has detected a failure in one of the "underlying" installation processes and has not been able to recover from it. Proper installation relies on many underlying processes, including tape and CD access, network functionality, and the ability to read and write files. In addition, *inst* cannot protect itself against changes to system files (for example, modified installation history files in */usr/lib/inst*). Recovery from this type of error usually requires fixing the underlying problem (cleaning tape-drive heads, for example) or working around the problem.

- Error messages from programs other than *inst*

```
dd: read error: I/O error
<n>+<m> records in
<n>+<m> records out
```

inst executes other programs and makes library and system calls that may print error messages of their own. If you see several non-*inst* messages followed by an **inst:** message, all of the messages are usually the result of a single error. The most common error messages of this type are included in Sections 8.4.2, "Messages Followed by the Interrupt/Error Menu," and 8.4.3, "Messages that Begin with "inst:" (No Interrupt/Error Menu)," below. Informational feedback from *inst* is easy to distinguish from this type of error: the first letter of the feedback is capitalized, and the message is usually in sentence form.

8.2 Diagnostic Procedures

This section presents some diagnostic procedures that can be used to isolate and identify the source of many error conditions.

8.2.1 Getting More Feedback from *inst*

Turning on the set options `verbose` and `verboserm` causes file names to be displayed as they are installed or removed and also causes auxiliary commands executed during `go` and `quit` to be displayed as they are executed. An error during the `go` or `quit` commands can give you information about how far `go` and `quit` progressed before failing. You can turn these options on and repeat the installation of a subsystem after you've gotten an error during `go` with these commands:

```
Inst> set verbose on
Inst> set verboserm on
Inst> install <subsystem_with_problem>
Inst> go
```

Similarly, you can retry the `quit` command with `verbose` turned on:

```
Inst> set verbose on
Inst> quit
```

8.2.2 Checking Network Connections

The steps below explain several tests and checks that you can perform to verify your workstations connection to a remote workstation.

1. Test the TCP/IP connection from IRIX.

If IRIX is running on your workstation, do a simple check of the network connection with this command:

```
% /usr/bsd/rsh <server> -l <user> date
```

where *<server>* is the name of the remote workstation and *<user>* is the user ID you are using for installation. Normally, *<user>* is "guest". If the date isn't returned, you've specified the wrong *<server>*, there is a network problem, or *<user>* isn't a valid user ID. See 3.3, "Configuring an Installation User ID," for more information about *<user>*.

2. Test the TCP/IP connection from *inst*.

Connections to remote workstations are done over terminal control program/internet protocol (TCP/IP) in a manner similar to *rsh(1C)*. A simple test of this connection can be done while you are doing an IRIX Installation by escaping to a shell from any *inst* prompt and using *ping(1M)*:

```
Inst> sh
```

```
# /usr/etc/ping -q -f -s 2048 -c 100 <server>
PING <server> (<IPaddress>): 2048 data bytes
```

```
----<server> PING Statistics----
100 packets transmitted, 100 packets received, 0% packet loss
round-trip (ms)  min/avg/max = 0/2/7
# exit
Inst>
```

where *<server>* is the name of the remote workstation. If you see packet loss, you could have a problem with your network connection.

This network connection test is not possible if you are using Miniroot Installation; if you are, test the connection before beginning the installation if possible. Use the same *ping* command as in the example above while in an IRIX shell.

3. Check the setting of the *netaddr* NVRAM variable.

In some situations, you might have network problems if the IP address (*<localIPAddress>*) of your workstation in its non-volatile random access memory (NVRAM) doesn't match its IP address in */etc/hosts*. A mismatch can occur when you move a workstation, but not cause a problem until you attempt to load the miniroot for a software installation. You can check the IP address in the NVRAM on your workstation while you are using IRIX, or when you have escaped to the shell while using *inst* (see Section 7.20, "Escaping to the Shell") by giving this command:

```
% /etc/nvram netaddr
```

From the Command Monitor, you can check IP address in the NVRAM with this command:

```
>> printenv netaddr
```

If the four part number returned from either command doesn't match the IP address in */etc/hosts* on your workstation (the value of *<localIPAddress>* that you noted while bringing up *inst*), change it with one of these two commands (not all models of workstations support changing NVRAM from IRIX):

```
# /etc/nvram netaddr <localIPAddress>
```

```
>> setenv netaddr <localIPAddress>
```

4. Verify that the remote workstation allows *tftpd*(1M) access.

Section 3.2, "Enabling TFTP Access on Remote Workstations," describes the procedure for verifying that the remote workstation has been modified to allow *tftp* access.

To get more debugging information, add the *-l* option to the *tftp* line in */usr/etc/inetd.conf* and restart *inetd*(1M). The line should look like this:

```
tftp dgram udp wait guest /usr/etc/tftpd tftpd -l
```

Debugging information is written to */usr/adm/SYSLOG*.

5. Verify that routers between your workstation and the remote workstation forward *bootp*(1M) packets.

Section 3.1, "Enabling BOOTP Forwarding on Routers," describes the procedure for verifying that routers have been modified to allow *bootp* access.

To get more debugging information, add the `-d` option to the `bootp` line in `/usr/etc/inetd.conf` and restart `inetd(1M)`. The line should look like this:

```
bootp dgram udp wait root /usr/etc/bootp bootp -f -d
```

Debugging information is written to `/usr/adm/SYSLOG`.

For more information on networking, see the *IRIX Advanced Site and Server Administration Guide* and the *NFS and NIS Administration Guide and Man Pages*.

8.2.3 Checking Tapes and Tape Drives

When you have a tape problem, the source of the problem could be one of the following:

- The tape is not compatible with your tape drive.
- The tape drive is not recognized by your system.
- The tape is not readable.
- The tape drive is not working properly.
- The tape isn't locked in the drive properly.
- You have incorrectly specified the tape device.
- A network problem is preventing you from accessing a remote tape drive.

This section describes procedures you can use to diagnose the source of your tape problem and gives historical data on the most likely and least likely sources of tape problems in the past, based on customer tape problems.

1. Verify that the tape is inserted properly in the tape drive.

Make sure that the tape is fully inserted and latched (if a latch is present) in the tape drive. When a latch is present, if you cannot slide or swing the tape-drive handle or latch into a locked position, the tape has not been inserted correctly. Take the tape out, rotate it, and try again.

2. Verify that the system recognizes the tape drive.

If IRIX is running, give the *hinv*(1M) command:

```
% hinv
```

For each tape drive, you should see one line of output. For example:

```
Tape drive: unit 3 on SCSI controller 0: DAT
Tape drive: unit 2 on SCSI controller 0: QIC 150
```

From the Command Monitor, give the *hinv* command:

```
>> hinv
```

For each tape drive, you should see one line of output (an error message from this command means that *hinv* is not available in the PROMs on your workstation). For example:

```
SCSI Tape: tpsc(0,2)
```

If you do not see a line of *hinv* output for each tape drive, shut down IRIX if it is running, and press the Reset button on the workstation. Use *hinv* again to check to see if the system now recognizes all tape drives. If one or more drives are still not recognized, there is a hardware problem with the tape drive unit or the installation of the tape drive.

3. Verify that your system recognizes that there is a tape in the tape drive.

You can verify that the tape drive is prepared to read the tape with this command (your output may differ) if IRIX is running:

```
% /bin/mt -t <nrtapedevice> stat
Controller: SCSI
Device: ARCHIVE: VIPER 150 21247-005 VP1
Status: 0x262
Drive type: QIC 150
Media : READY, write protected, at BOT, block 1
```

where *<nrtapedevice>* is a no rewind tape device (see Section 7.4, "Choosing Tape Device Names"). For this all other *mt*(1) commands in this section, you can omit "*-t <nrtapedevice>*" if you are using a tape drive that is linked to */dev/nrtape* (see Section 7.4).

The "Media" line should show "READY." If it shows "Not READY," the tape has not been inserted properly or there is some other problem. The "Drive type" line shows the tape drive type.

4. Rewind the tape.

Make sure that the tape is rewound to the beginning of the tape (BOT) with this command:

```
% /bin/mt -t <nrtapedevice> rewind
```

5. Verify that the tape(s) and tape drive you are using are compatible.

Give this command to verify that the tape and the tape drive are compatible:

```
% /bin/dd if=<nrtapedevice> of=/dev/null bs=16k
```

where <nrtapedevice> is a no rewind tape device as above. If your tape drive is linked to /dev/nrtape (the default configuration), <nrtapedevice> is "/dev/nrtape". The dd(1) commands in the remainder of this section use the same value of <nrtapedevice> as you use here.

If you get a shell prompt back, the tape and the tape drive are compatible. If they are not compatible, you get this message:

```
dd: read error: No space left on device
0+0 records in
0+0 records out
```

You can also determine tape and tape drive compatibility by comparing the tape label and the tape drive type. Table 8-1 shows the types of 1/4-inch tape drives that read each type of 1/4-inch tape.

Tape Size	Tape Format	Compatible Tape Drive Types for Reading
15MB, 60MB	QIC24	QIC 24, QIC 150, QIC 1000 (i.e. all 1/4-inch tape drives)
150MB	QIC150	QIC 150, QIC 1000

Table 8-1 Tape and Tape Drive Compatibility for Software Distribution Tapes

The *hinv*(1M) and *mt* commands report the type of tape drive you have. (For directions on using *hinv* from IRIX and the PROM Monitor see Section 7.2, and for directions on using *mt* see the *mt stat* example in Step 3 above.)

6. Check to see if the data on the tape is readable.

On the workstation with the tape drive, give commands to read one image at a time from the tape to find out if there is a tape error. This sequence of commands (possibly with a different tape device name and/or a different number of *dd* commands as discussed below) is called *<basic commands>* in the remainder of this section.

```
% /bin/mt -t <nrtapedevice> rewind
% /bin/dd if=/dev/nrtape of=/dev/null bs=16k
% /bin/mt -t <nrtapedevice> rewind
```

The basic command sequence takes several minutes. You should see counts of records being read in and out and no error messages as the records are read and discarded. If you get error messages, skip to Step 8.

If the workstation has more than one tape drive, you may need to specify a different tape device. See Section 7.4, "Choosing Tape Device Names," for directions for constructing a different tape device name.

If you are checking a tape that contains Installation Tools only, you'll need to modify the *<basic commands>* by giving the *dd* command only twice. For other tapes, you may have to give the *dd* command more than five times to read the entire tape. To find out how many *dd* commands are required to read the entire tape, give *dd* commands until you get this error:

```
dd: read error: No space left on device
0+0 records in
0+0 records out
```

7. If the tape drive is on a remote workstation, make sure that the tape is readable from your workstation.

From your workstation, log in to the remote workstation and give the basic commands:

```
% /usr/bsd/rlogin <server> -l <user>
% <basic commands>
% logout
```

where *<server>* is the name of the remote workstation and *<user>* is the user ID that will be used on the remote workstation (default is *guest*). If this test is successful, *inst* should be able to access the tape.

If Step 6 was successful, but this step was not, the problem may be that network connection is bad. The procedure for testing the network is described in Section 8.2.2, "Checking Network Connections." Continue on with Step 8 for other tests which can help you isolate your problem.

8. Isolate your problem to a particular tape or tape drive.

If the tests in Steps 6 or 7 were unsuccessful, other testing combinations should enable you to deduce whether the problem is your tape or your tape drive. The complete list of test combinations is shown in Table 8-2.

Tape	Test	Tape Drive Location
distribution tape	basic commands	local workstation
distribution tape	remote basic commands	remote workstation
distribution tape	remote basic commands	different remote workstation
a different software distribution tape	basic commands	local workstation
a different software distribution tape	remote basic commands	remote workstation
<i>tar, cpio, or bru</i> tape	<i>tar, cpio, or bru</i>	local or remote workstation

Table 8-2 Tape Tests

9. If the problem appears to be your tape drive, first clean your tape drive heads using the procedure in the next section. Next, check the alignment of your tape drive heads using a performance analysis 1/4-inch cartridge tape as discussed on the *Data Cartridge Recommendations* card that comes with software distribution tapes.

A Silicon Graphics analysis of customers' problems reading software distribution tapes determined that the first and second most likely causes of installation tape problems are dirty tape drive heads and out-of-alignment tape drives.

10. If the problem appears to be a bad tape, retension the tape as described in the next section. If that doesn't solve the problem, call the Technical Assistance Center or your support organization (see Section 8.7) and ask for a replacement tape. In the United States, the replacement tape will be sent with a postage-paid box which you should use to return the bad tape to Silicon Graphics for further analysis.

If you are having difficulty reading a tape, a bad tape is one of the least likely causes of the problem. An investigation of returned "bad" tapes concluded that less than 0.03% of the software distribution tapes shipped by Silicon Graphics contain duplication errors.

8.2.4 Retensioning Tapes and Cleaning Tape Drives

You can retension the tape from IRIX on any workstation that has a tape drive. This easy operation takes only a few minutes to perform and sometimes solves tape reading problems. The command is:

```
% /bin/mt -t <nrtapedevice> retension
```

where *<nrtapedevice>* is a no-rewind tape device (see Section 7.4). If "*-t <tapedevice>*" is not given, the device */dev/nrtape* will be used by default.

To clean the tape drive heads of your 1/4-inch cartridge tape drive, you will need the following items:

- Isopropyl alcohol, 91% or 99%, or a Freon "TF" type head cleaning solution.
- Cleaning swabs, 6 inches or longer, made of lintless cotton or equivalent lintless, non-abrasive material.

Follow this procedure for cleaning 1/4-inch tape drive heads:

1. Shut down the workstation and turn it off. If you have an external tape drive, turn it off, too.
2. Slide or swing the lever on the front panel of the tape drive so that the heads are extended into the cartridge area.
3. Dip a swab into the cleaning solution. The swab must be saturated, but not dripping.
4. If using a cotton swab, insert the saturated swab into the cartridge area spade end first. Without touching any of the other parts, clean the head surfaces by wiping the swab several times in an up and down motion across the head surfaces.

Caution: When cleaning, the swab should always be moved across the heads in a direction perpendicular to the direction the tape moves across the heads. Movement of the swab across the heads in any other direction can cause residue to reside in minute crevices on the head surface, with subsequent interference of data transfer.

5. If using a cotton swab, discard the used swab and repeat Steps 3 and 4 with a clean swab until the swab comes away from the head with no visible sign of dirt or residue.
6. If using a plastic cleaning swab, drip solution onto the coarse (green) side of the swab and make one pass up or down across the head. Reapply solution to the white side and use an up and down wiping motion across the heads.
7. With a clean dry swab, remove any residue of cleaning fluid, using the same up and down motion described in Step 4.

Caution: All residue must be completely removed from head surfaces and the heads and adjacent surfaces must be dry and clean before a cartridge may be inserted in the drive.

8. Move the lever to reposition the head assemblies in their resting positions outside of the cartridge area.
9. Turn on power to the external tape drive, if present, and then turn on power to the workstation.

8.2.5 Checking CD-ROM Drives

To check CD-ROM drives, you must verify that:

- The system recognizes the CD-ROM drive.
- The CD you want to use is mounted.

The sections below explain the procedures.

Verifying That a CD-ROM Drive is Recognized

The procedure to verify that a CD-ROM drive is recognized depends on your situation:

- If IRIX is running, give the *hinv* command:

```
% hinv
```

For each CD-ROM drive, you should see one line of output. For example:

```
CDROM: unit 4 on SCSI controller 0
```

If you do not see a line of output for a CD-ROM drive, it is not recognized.

- If you are in the miniroot, escape to a shell with the *shroot* command (see Section 7.20), and give the *hinv* command:

```
# hinv
```

For each CD-ROM drive, you should see one line of output. For example:

```
CDROM: unit 4 on SCSI controller 0
```

If you do not see a line of output for a CD-ROM drive, it is not recognized.

- If you are in the Command Monitor, give the *hinv* command:

```
>> hinv
```

For each CD-ROM drive, you should see one line of output. Some examples are:

```
SCSI CDROM: dksc(0,4)  
SCSI CDROM: scsi(0)cdrom(4)  
SCSI Disk: dksc(0,4)
```

The last example shows the CD-ROM drive on an older workstation. The CD-ROM drive is recognized, but it is shown as a disk. If you do not see a line of output for a CD-ROM drive, it is not recognized.

When a CD-ROM drive is not recognized, it usually because the CD-ROM drive was not powered up properly. If it is an external drive, the CD-ROM drive must be powered on before the workstation main unit is powered on.

The procedure for making the system recognize the CD-ROM drive depends on whether you are running IRIX or the miniroot:

- If you are running IRIX, exit *inst* if it is running, warn other users, shut the workstation down with *shutdown(1M)* or use System Shutdown on the System menu, then reboot the workstation to bring up IRIX again.
- If you are in the miniroot, get back to the PROM Monitor, press the Reset button on the workstation main unit, and then bring up *inst* again. If this doesn't fix the problem, turn the CD-ROM drive off and then on again.

Verifying That a CD is Mounted

When using a CD-ROM drive, the CD that contains the software you want to install must be mounted. Mounting is done automatically by *inst* when using a local CD-ROM. When using a remote CD-ROM, the mounting is done by the command *cdinstmgr(1)* (see Section 4.6, "Preparing for Installing from a Remote Distribution Source"). To verify that the CD is mounted, use the *df(1)* command below. If you are using local CD-ROM, escape to a shell (see Section 7.20). If you are using a remote CD-ROM, give the command on the remote workstation.

```
% /bin/df
```

Look at the directory names on the right. For local CD-ROM, you should see */CDROM*. For remote CD-ROM, the name */CDROM* is likely, but another directory name for the mount point, *<CDdir>*, may have been chosen.

If the CD is mounted, list the files it contains using the procedure in Section 8.2.6 in order to verify that you have the correct CD inserted. If the CD is not mounted and you are using a remote workstation, verify that *cdinstmgr* is running. If it isn't, start it using the procedure in Section 4.6.

8.2.6 Checking Distribution Directories and CDs

To verify that a distribution directory or a mounted CD contains the right files, the workstation that contains the distribution must be running IRIX. Change directories to the directory (*<distdir>* or *<CDdir>/dist*) and list the files with *ls(1)*. Files in software distributions have these names:

```
mr
sa
<product>
<product>.idb
<product>.<image>
...
```

The file *sa* is used for Miniroot Installations only, so it doesn't need to be present if you are doing an IRIX Installation. The file *mr* may or may not be present; there is no problem if it is missing. More than one product file, *<product>*, may be in the directory. Each product requires a file called *<product>.idb* (installation database) and one or more *<product>.<image>* files. Examples of *<product>* files are *eoel* and *maint_nfs*. Common values of *<image>* are *man* and *sw*.

If a distribution directory does not have the correct files, the most likely causes are that the *distcp(1M)* command was not used correctly to create the distribution directory, or that the files in the distribution directory were modified after it was created.

If you suspect that the contents of the files in the distribution directory have been corrupted, try installing from the tape or CD that was used to create the distribution directory. If the same error occurs, then the problem is not with the distribution directory. If the installation from tape or CD is successful, remove the files in the distribution directory and recreate it.

An additional check is possible for CDs: change directories to *<CDdir>* and list the files with *ls*. One file and at least two directories should be listed:

```
RELEASE.info
dist
stand
```

RELEASE.info is an ASCII text file that contains release information. *dist* is a directory that contains the software distribution and *stand* is a directory that contains standalone tools such as *sash* and *fx*. *Release Notes* describe the exact contents of each CD.

8.2.7 Verifying Minimum Installation Requirements

The following list contains the bare minimum environmental and system requirements for installation. If you are running into trouble, verify that your software distribution source, network (if used), and workstation meet these requirements:

1. You must have a software distribution source that you can read (see Section 4.2, "Identifying Your Software Distribution Source," for the possible software distribution sources and Sections 8.2.3, 8.2.5, and 8.2.6 above for verification procedures).
2. For remote distribution sources, you must have a reliable network connection throughout your installation session.
3. The system disk on your workstation (usually it is `<unit> 0` if it's an ESDI, IPI, or SMD disk and `<unit> 1` if it's a SCSI disk) must have a `/` (root) file system and a swap partition. Usually it has a `/usr` partition as well, but this isn't required. Use `fx(1M)` from the PROM Monitor to partition the disk and create the `/` and swap partitions if you are starting with an empty disk. You will be starting with an empty, unformatted disk whenever you have reformatted the disk to avoid bad sectors, you have changed disk partitions, or you've replaced your system disk with a disk that has not been partitioned as a system disk.
4. If you are using the Miniroot Installation method, your swap partition must be at least 28 MB for releases prior to Release 5.0 and 32 MB for Release 5.0 and later.
5. You need enough disk space for the subsystems you plan to install plus some additional space that is used temporarily during installation. Disk space requirements are available in the *Release Notes* for the various products and are given in the output of the `list` command. Temporary disk space (installation overhead) is required during installation and is shown in the output of the `list` command. In addition, if you installed any subsystems marked `@` (Miniroot Installation required), there must be approximately 1700 blocks available in the `/` file system after all subsystems are installed. This disk space is required for kernel reconfiguration and should be checked with the `list` or `space` command just prior to giving the `quit` command.
6. Your workstation must have the correct time to within a few minutes. The date and time are displayed when you first bring up `inst` from the miniroot, and you can check them while you are using `inst` with the `date` command on the Administrative Commands Menu.

8.3 Problems During Preparation for Running *inst*

This section explains common error messages that can occur while performing the procedures in Chapter 4, "Bringing Up *inst*."

8.3.1 If You See This Error Message ...

```
dk<unit> error: unrecognized scsi disk drive
dksc(0,<unit>,8)sash.<cpu>: Command not found
```

while you are using local CD-ROM and Miniroot Installation,

unrecognized disk

Possible Causes Are ...

- The *dksc* command was not typed correctly: `--m` was given instead of `-m`.
- No CD is in the CD-ROM caddy.
- No caddy is in the CD-ROM drive.
- The CD-ROM drive is not ready.
- A workstation with older PROMs that do not recognize CD-ROM drives is being used. *fx*, *ide* (diagnostics), or *sash* was started and exited normally. Afterwards, the older PROMs don't recognize the CD-ROM drive.
- A previous installation was terminated abnormally.

What You Should Do Is ...

- Check to make sure a caddy with a CD is in the drive.
- Press the Reset button on the workstation main unit and begin the installation process again.
- Follow the procedure for checking CD-ROM drives in Section 8.2.5.

8.3.2 If You See This Error Message ...

```
CD-ROM drive not recognized
```

while using local CD-ROM and IRIX Installation,

*CD-ROM not
recognized*

Possible Causes Are ...

IRIX doesn't recognize that the CD-ROM drive is present.

What You Should Do Is ...

- Shut down the workstation as described in Section 8.2.5, check to make sure that the CD-ROM drive is connected and turned on, and then start the installation process over again.
- If shutting down the workstation doesn't fix the problem, try turning the CD-ROM drive off and then on again.
- Follow the remainder of the CD-ROM checking procedure in Section 8.2.5.

8.3.3 If You See This Error Message ...

```
dks0d3s8: Unexpected blank media: ASC=0x64
dks0d3s8: Can't read volume header
Error 20 while loading scsi(0)cdrom(3)partition(8)sashARCS
```

while using a CD-ROM distribution source and Miniroot Installation,

*unexpected blank
media*

Possible Causes Are ...

The program *cdman*(1) was killed, which left the CD-ROM drive in audio mode rather than data mode.

What You Should Do Is ...

1. Quit out of *inst*.
2. Return to the PROM Monitor.
3. Press the Reset button on the workstation.
4. Begin the installation again.
5. See Section 8.2.5, "Checking CD-ROM Drives," if you continue to have problems.

8.3.4 If You See This Error Message ...

```
Unable to load dksc(<cntl>,<unit>,8)sash<cpu>: file not found
```

or

```
dksc(<cntl>,<unit>,8)sash<cpu>: invalid
Unable to load dksc(<cntl>,<unit>,8)sash.<cpu>: file not found
```

or

```
open(bootp(<server>:<CDdir>/dist/sa(sash.<cpu>)) failed, errno=2
Unable to load bootp(<server>:<CDdir>/dist/sa(sash.<cpu>): file not found
```

during Miniroot Installation from CD-ROM,

file not found

Possible Causes Are ...

You are trying to load the miniroot from a CD that does not contain Installation Tools.

What You Should Do Is ...

Switch to a CD that includes Installation Tools to load the miniroot, then switch back to your original CD.

8.3.5 If You See This Error Message ...

```
tp<unit>: (8) No data on tape
tp<unit>: failed to read in volume header
Unable to load tpssc(0,<unit>) (sash.<cpu>)
```

OR

```
couldn't determine fs type
Unable to load tpssc(0,<unit>) (sash.<cpu>)
```

while using a tape distribution source and Miniroot Installation,

*Unable to load from
tape*

Possible Causes Are ...

- The tape is not rewound to the beginning, usually because of an aborted previous installation using this tape.
- You are using a 150MB tape on an incompatible (QIC 24) tape drive.

What You Should Do Is ...

- Follow the procedures for verifying tape and tape drive compatibility and retensioning the tape in Sections 8.2.3 and 8.2.4. If you are using local tape, you can use the tape drive on another workstation, if available; otherwise you need to bring up IRIX on the local workstation in order to retension the tape.
- If retensioning the tape fails to solve the problem, continue with the diagnostic procedures in Section 8.2.3.

8.3.6 If You See This Error Message ...

```
Remote file <server>:<tapedevice> format not valid: first block is not a
tape directory
Unable to load bootp(<server>:<tapedevicedir>) (sash.<cpu>):
``bootp(<server>:<tapedevice>) (sash.<cpu>)' is not a valid file to
boot.
```

OR

```
Remote file <server>:<tapedevice> format not valid: first block is not a
tape directory
Error 7 while loading network(0)bootp(<server>:<tapedevice> (sash.<cpu>)
```

OR

```
Error 7 while loading network(0)bootp(<server>:<tapedevice> (sash.<cpu>)
```

when using a remote tape distribution source,

**remote file format
not valid**

Possible Causes Are ...

- You've specified a tape device on the remote workstation that is a non-byte-swapped device. The default device used is */dev/tape* and it should be linked to a byte-swapped device.
- *<tapedevice>* doesn't correspond to a tape drive on the remote workstation.
- The tape you are using doesn't contain Installation Tools.
- There is no tape in the tape drive.

What You Should Do Is ...

- Give the full pathname of the correct tape device when loading the miniroot (see the procedure in Section 7.1, "Loading the Miniroot from the Command Monitor").
- Relink */dev/tape* on the remote workstation to a byte-swapped device and try loading the miniroot again.
- Confirm that tape in the tape drive includes Installation Tools.
- Press the Reset button and try again.
- Follow the directions for checking tape drives in Section 8.2.3, "Checking Tapes and Tape Drives."

8.3.7 If You See This Error Message ...

```
No server for <server>:<path> (sash.<cpu>)
Unable to load bootp(<server>:<path> (sash.<cpu>):file not found
```

OR

```
No server for <server>:<CDdir>/dist (sash.<cpu>)
open(bootp<server>:<CDdir>/dist (sash.<cpu>) failed, errno = 6
Unable to load bootp(<server>:<CDdir>/dist (sash.<cpu>):file not found
```

after you gave Command Monitor commands to load the miniroot from remote CD-ROM or distribution directory,

No server

Possible Causes Are ...

You forgot to include **/sa** at the end of the *setenv* command that you gave just before the *boot* command.

What You Should Do Is ...

Give the corrected *setenv* command with **/sa** at the end and then give the *boot* command again.

8.3.8 If You See This Error Message ...

```
TFTP error: I/O error (code 0)
Unable to load bootp(<server>:<path>(sash.<cpu>):
''bootp(<server>:<dist>/sa(sash.<cpu>))'' is not a valid file to boot.
```

OR

```
TFTP error: Access violation (code 2)
bootp(<server>:<dist>/sa(sash.<cpu>): invalid
Unable to load bootp(<server>:<dist>/sa(sash.<cpu>):
''bootp(<server>:<dist>/sa(sash.<cpu>))'' is not a valid file to boot.
```

OR

```
bootp(<server>:<dist>/sa(sash.<cpu>): invalid
Unable to load bootp(<server>:<dist>/sa(sash.<cpu>):
''bootp(<server>:<dist>/sa(sash.<cpu>))'' is not a valid file to boot.
```

after you gave the command to copy the miniroot from a remote distribution source into the swap partition,

not a valid file to boot

Possible Causes Are ...

- You have incorrectly specified *<server>*, *<path>*, or *<cpu>*.
- There is no physical connection between your workstation and the remote workstation.
- The file */usr/etc/inetd.conf* on the remote workstation has not been modified to allow *tftp(1C)* access to the tape device, CD-ROM mount point directory, or distribution directory.
- Routers in between your workstation and the remote workstations have not had *bootp(1M)* forwarding enabled. (*/usr/etc/inetd.conf* is modified on IRIX systems).

- A remote distribution directory is corrupted.
- You are trying to use a software distribution tape that does not include Installation Tools (the miniroot).
- There is no tape in the remote tape drive or the tape is not locked in place.

What You Should Do Is ...

- Check *<server>* (the remote workstation name), *<path>* (the distribution directory), and *<cpu>* (the CPU number) to make sure that you have spelled them correctly and they exist.
- Try to copy the miniroot using the instructions in Section 7.1; you may see additional error messages that help you determine the cause of the problem.
- Check */usr/etc/inetd.conf* on the remote workstation. The line containing *tftp* should have been modified and *inetd* killed as explained in Section 3.2.
- Check */usr/etc/inetd.conf* on each of the routers between your workstation and the remote workstation to make sure that it has been modified as explained in Section 3.1.
- Check Ethernet® or other network cables and connections on the local and remote workstations.
- Check the *netaddr* variable to make sure that it is set correctly (Section 8.2.2).
- If possible, check the network connection to the remote workstation from a third workstation on the same network using the procedure in Section 8.2.2.
- If your workstation is a router (has multiple network connections) you may have to change your network connections so that the “normal” network device is connected to the same network as the remote workstation. Miniroot Installation is not supported over FDDI (IRIX Installation is supported.)
- If necessary, bring up IRIX on the local workstation and check the network connection with the procedure in Section 8.2.2.
- Check the distribution directory using the information in Section 8.2.6.
- Perform additional procedures from Section 8.2.2, to identify the problem.

8.3.9 If You See This Error Message ...

```
file <file> not found in <server>:<path>/sa; directory contains:  
...  
Unable to load bootp()...
```

or

```
File <CDdir>/dist/sa not found on server <server>  
Unable to load bootp(<server>:<CDdir>/dist/sa(sash.<cpu>): no such file  
or directory
```

or

```
File <tapedevice> not found on server <server>  
Unable to load bootp(<server>:<tapedevice>(sash.<cpu>): no such file or  
directory
```

during Miniroot Installation,

file not found,

Possible Causes Are ...

- The *boot* command contained a typo in the **sash.<cpu>**, **sash<cpu>**, or **sashARCS** portion of the command.
- The remote workstation name (<server>) was mistyped.
- The *netaddr* variable is not set correctly to your IP address (<IPaddress>).
- *bootp*(1M) is not running on the remote workstation.
- <tapedevice> is incorrect.

What You Should Do Is ...

- Examine the last command you gave and look for a spelling or capitalization error, the wrong <cpu> in the **sash.<cpu>** portion of the command, **sash.IP12** rather than **sashIP12**, **sash.IP17** rather than **sashIP17**, or any **sash** command with **IP19**, **IP20**, or **IP22** rather than **sashARCS**. Give the command again with the typo corrected.
- Verify that you are specifying the correct fixed block, byte-swapped, rewind tape device.
- Check */usr/adm/SYSLOG* on the remote workstation to see if it contains *bootp* messages. If they are there, then *bootp* is running, and the likely cause of the problem is that *netaddr* is set incorrectly on your workstation.
- If the remote workstation has multiple network interfaces, try specifying the hostname for each interface in turn. This sometimes works around

routing problems. To get the hostname for each interface give this command:

```
% /usr/etc/netstat -i
```

The Address column in the output contains the hostnames.

- Perform additional checks described in Sections 8.2.2 through 8.2.6.

8.3.10 If You See This Error Message ...

```
Installation tools not found at <server>:<tapedevice>
```

or

```
Installation tools not found at <server>:<CDdir>/dist
```

or

```
Installation tools not found at <server>:<path>
```

during Miniroot Installation from a remote software distribution,

*Installation tools not
found*

Possible Causes Are ...

- You are trying to load the miniroot from a tape, CD, or distribution directory that doesn't contain Installation Tools.
- The version of PROMs on your IP19, IP20, or IP22 workstation doesn't support using Install System Software to load the miniroot from a tape device that isn't linked to */dev/tape*.

What You Should Do Is ...

- Confirm that the tape, CD, or distribution directory you are using contains Installation Tools.
- Link the tape device you want to use on the remote workstation to */dev/tape* and try again. Execute */dev/MAKEDEV* to return the tape devices to their default configuration after you complete the installation.
- Use the Command Monitor to load the miniroot from remote tape. The directions are in Section 7.1.

8.3.11 If You See This Error Message ...

```
Error 20 while loading scsi()tape(<unit>)(sashARCS)
```

or

```
Unable to load <device><cntl>, <unit>)(sash.<cpu>): no volume header on  
device
```

during Miniroot Installation from local tape,

no volume header

Possible Causes Are ...

You are trying to load the miniroot from a tape that doesn't contain Installation Tools.

What You Should Do Is ...

Switch to a tape that includes Installation Tools to load the miniroot, then switch back to your original tape.

8.3.12 If You See This Error Message ...

```
dd: read error: I/O error
<n>+<m> records in
<n>+<m> records out
```

while you are using local or remote tape,

read error

Possible Causes Are ...

- No tape is in the tape drive.
- The tape-drive heads are dirty.
- The tape is not rewound to the beginning of the tape.
- You have a faulty copy of the software distribution tape.

What You Should Do Is ...

Isolate the problem using the procedures described in Section 8.2.3, "Checking Tapes and Tape Drives."

8.3.13 If You See This Error Message ...

```
bootp(<server>:<dist>/sa/(sash.<cpu>) is not in a.out format
after you initiate the loading of the miniroot,
```

not in a.out format

Possible Causes Are ...

- There are network problems or the network is too loaded.
- An incorrect distribution directory name was given.
- The file *sa* in the distribution is damaged.

What You Should Do Is ...

Check the network with the procedures in Section 8.2.2, or try again later.

8.3.14 If You See This Error Message ...

root and swap are on the same partition. This is most likely because a previous installation was in progress. If so, you may continue the boot into the miniroot. Otherwise the partition info needs to be corrected.

Do you wish to continue booting (y or n)

after you have given the command to copy the miniroot to the swap partition,

*root and swap
partitions are the
same*

Possible Causes Are ...

The power failed or the system was reset during installation, and the miniroot is still in the swap partition.

What You Should Do Is ...

First decide whether you need to return to *inst* to complete your installation, or you are ready to restart your system.

If you need to return to *inst*, answer **yes** to the question. The Inst Main Menu should appear, and you can finish your installation.

If you are ready to restart your system, or if you answered **yes** and the Inst Main Menu didn't appear (usually because the previous load of the miniroot failed), then you must load the standalone version of *fx(1M)* to fix the problem before your system can restart. The remainder of this section contains the procedure for using *fx* to restore your swap partition. It assumes that the 4D1-4.0 or later version of *fx* is used.

1. Answer **no** to the question "Do you wish to continue booting?"
2. Respond to the next prompt by pressing **<Enter>**:

Unable to continue; press Enter to return to menu: **<Enter>**

3. The five-item System Maintenance Menu appears. Choose Enter Command Monitor by entering:

5

4. Invoke *fx* from the Command Monitor. See the *fx(1M)* manual page for complete instructions on invoking *fx* or use these examples:

- Invoke the copy of *fx* on your workstation:

```
>> boot stand/fx --x
```

- Invoke *fx* from a tape with Installation Tools in a tape drive on your workstation. If your CPU is IP4, IP5, IP6, IP12, or IP17 the command is:

```
>> boot -f <device>(<cntl>, <unit>) fx.<cpu> --x
```

If your CPU type is IP7 or IP9 the command is:

```
>> boot -f <device>(<cntl>, <unit>) fx.IP5 --x
```

If your CPU type is IP19, IP20, or IP22 the command is:

```
>> boot -f <device>(<cntl>, <unit>) fx.ARCS --x
```

where *<device>*, *<cntl>*, *<unit>*, and *<cpu>* are obtained from the output of *hinu* (see Table 7-3). This command takes a very long time.

- Invoke *fx* from a tape with Installation Tools in a tape drive on a remote workstation named *<server>*. If your CPU is IP4, IP5, IP6, IP12, or IP17 the command is:

```
>> boot -f bootp(<server>:<tapedevice>) (fx.<cpu>) --x
```

If your CPU type is IP7 or IP9 the command is:

```
>> boot -f bootp(<server>:<tapedevice>) (fx.IP5) --x
```

If your CPU type is IP19, IP20, or IP22 the command is:

```
>> boot -f bootp(<server>:<tapedevice>) (fx.ARCS) --x
```

where *<tapedevice>* and *<cpu>* are obtained from the output of *hinu* (see Table 7-3). This command takes a very long time.

- Invoke *fx* from a CD with Installation Tools in a CD-ROM drive on your workstation. If your CPU type (*<cpu>*) is IP4, IP5, or IP6 the command is:

```
>> boot -f dksc(<cntl>, <unit>, 8) sash.<cpu> dksc(<cntl>, <unit>, 7) stand/fx.<cpu> --x
```

If your CPU type is IP7 or IP9 the command is:

```
>> boot -f dksc(<cntl>, <unit>, 8) sash.<cpu> dksc(<cntl>, <unit>, 7) stand/fx.IP5 --x
```

If your CPU type is IP12 or IP17 the command is:

```
>> boot -f dksc(<cntl>, <unit>, 8) sash.<cpu> dksc(<cntl>, <unit>, 7) stand/fx.<cpu> --x
```

If your CPU type is IP19, IP20, or IP22 the command is:

```
>> boot -f dksc(<cntl>, <unit>, 8) sashARCS dksc(<cntl>, <unit>, 7) stand/fx.ARCS --x
```

where *<ctrl>* and *<unit>* are the controller and unit numbers of the CD-ROM drive (see Section 7.3, "Getting Controller and Unit Numbers for CD-ROM Drives").

- Invoke *fx* from a CD with Installation Tools that is mounted on a remote workstation named *<server>*. If your CPU is IP4, IP5, IP6, IP12, or IP17 the command is:

```
>> boot -f bootp()<server>:<CDdir>/stand/fx.<cpu> --x
```

If your CPU type is IP7 or IP9 the command is:

```
>> boot -f bootp()<server>:<CDdir>/stand/fx.IP5 --x
```

If your CPU type is IP19, IP20, or IP22 the command is:

```
>> boot -f bootp()<server>:<CDdir>/stand/fx.ARCS --x
```

where *<CDdir>* is the mount point directory for the CD, for example */CDROM*, and *<cpu>* is the CPU type of your workstation.

5. After *fx* is invoked, messages, prompts, and menus appear. A sample session is shown below. In this sample session, the default system disk device name, controller number and drive number chosen by *fx* (dksc, 0, and 1 respectively) are used. Unless your workstation is configured in a non-standard way, the defaults chosen by *fx* will be correct and you can respond with **<Enter>** to the these prompts.

```
Obtaining /stand/fx from server <server>
<n>+<n>+<m> entry: <p>
fx version 4.0 IP6, Aug 23, 1991
fx "device-name" = (dksc) <Enter>
fx: ctrlr# = (0) <Enter>
fx: drive# = (1) <Enter>
...opening dksc(0,1,)
...controller test...OK
Scsi drive type == CDC          94171-9          0184

----- please choose one (? for help, .. to quit this menu)-----
[exi]t          [d]ebug/          [l]abel/          [a]uto
[b]adbblock/    [ex]ercise/        [r]epartition/    [f]ormat
fx> label/create/boot

...creating default bootinfo

----- please choose one (? for help, .. to quit this menu)-----
[exi]t          [d]ebug/          [l]abel/          [a]uto
[b]adbblock/    [ex]ercise/        [r]epartition/    [f]ormat
fx> exit

label info has changed for disk dksc(0,1,). write out changes? (yes) <Enter>
```

6. At this point the screen clears and the five item System Maintenance Menu appears. Press **1** to choose Start System and your system will be restarted or press **2** to restart the installation.

8.3.15 If You See This Error Message ...

```
initsh: /usr/sbin/instdriver: not found
init: Command is respawning too rapidly. Check for possible errors.
id:  co "/usr/sbin/instdriver > /dev/console 2>&1 < /dev/console"
```

after you started the copying of the miniroot to the swap partition (you probably also saw fewer dots than usual and then the copy complete message),

can't find instdriver Possible Causes Are ...

Only part of the miniroot was copied from the software distribution source to the swap partition, probably because of networking or device problems.

What You Should Do Is ...

Try the command to load the miniroot again.

8.4 Problems While Using *inst*

This section explains common error messages that can occur while performing the procedures in Chapter 5, "Using *inst*." They are organized by the appearance of the error message.

8.4.1 Messages with Capitalized Titles

Messages that begin with titles in all capital letters are discussed in this section.

8.4.1.1 If You See This Error Message ...

```
MISSING REQUIRED SUBSYSTEMS
```

The following subsystems are required for basic system functionality. They are not currently installed and are not selected for installation. See "help required" for more information.

**missing
subsystems**

Possible Causes Are ...

Certain subsystems have been designated "required" in their product description files because no workstation operates correctly without them. *inst* insists that these required subsystems be installed, so that you don't get stuck with a workstation that won't operate because critical software is missing.

What You Should Do Is ...

Select the subsystems listed in the error message for installation and give the `go` command again.

8.4.1.2 If You See This Error Message ...

MINIROOT INSTALLATION REQUIRED

The following subsystems cannot be installed under IRIX. You must use the `miniroot` to install them. See "help `miniroot`" for more information.

(list of subsystems)

miniroot required

Possible Causes Are ...

You are currently using IRIX Installation when one or more subsystems you are trying to install require Miniroot Installation.

What You Should Do Is ...

You won't be able to install the subsystem(s) listed in the message in this installation session. You can complete the installation of other subsystems you selected at this time, or exit *inst* without performing any installations. If you decide to continue, you'll have to deselect the listed subsystem(s) with `keep`. In order to install the listed subsystem(s), you have to begin the installation process again using Miniroot Installation.

8.4.1.3 If You See This Error Message ...

OLDER VERSIONS REQUESTED

You have requested that the subsystems below be replaced with older versions of those subsystems. *Inst* will not replace currently installed subsystems with older versions of those subsystems unless you give the command "set `neweroverride` on". Use "help `set`" and read the section on `neweroverride` for more information.

(list of subsystems)

*older versions
requested*

Possible Causes Are ...

You've requested that an older release of software replace what's already installed. *inst* guesses that this is a mistake and tells you about it.

What You Should Do Is ...

- If this is really what you want to do, give the command:

```
Inst> set neweroverride on
```

and give the `go` command again.
- If you did make a mistake, use the `keep` command to deselect the older subsystems and continue with the installation.

8.4.1.4 If You See This Error Message ...

MISSING PREREQUISITES

The following subsystems cannot be installed because prerequisite software is not installed and is not selected for installation. See "help prerequisite" for more information.

(subsystems and prerequisites)

*missing
prerequisites*

Possible Causes Are ...

You've selected a subsystem for installation that can't be used unless another subsystem is also installed. *inst* requires that you install these prerequisite subsystems first or at the same time.

What You Should Do Is ...

Take one of these actions:

- If the prerequisite subsystem is also in the software distribution, select it for installation and proceed with the installation.
- Deselect the subsystem that caused the problem and continue with your installation. You can switch to the distribution that contains the prerequisite subsystem and then back to the original distribution to complete your installation.
- Decide not to install the subsystem that caused the problem.

The *Release Notes* for the various products list prerequisite subsystems if any.

8.4.1.5 If You See This Error Message ...

NOT ENOUGH DISK SPACE

Installation of the currently selected subsystems will require more disk space than is currently available. The numbers displayed below show the estimated increase in disk space usage that will result from installing the currently selected subsystems.

(disk space information)

You can decrease the installation requirement by selecting fewer subsystems. You can increase the available disk space by removing unnecessary subsystems or files from the disk. Use "help spaceerror" for more information.

*not enough disk
space*

Possible Causes Are ...

- The new version of the software that you are trying to install is much larger than the old version, and you don't have sufficient free disk space to accommodate the growth.
- You don't have sufficient free disk space to install the new subsystems you are trying to install.

What You Should Do Is ...

Review the *Release Notes* for the products you are trying to install. The *Release Notes* list the disk space required for each subsystem.

Review the sample installation session in Section 5.7, "Sample Session 3," and try the techniques shown there:

- Escape to a shell (see Section 7.20) and remove user files.
- Choose fewer subsystems for installation.
- Remove installed subsystems that you no longer need.

You can find out in two ways what the effect of removing installed subsystems would be:

- Select subsystems for removal; then give the command **list** and look at the disk space change.
- Give the command **list sizes** and look at the absolute sizes of the new version of each of the subsystems. This gives you an idea how much disk space older installed versions are using.

You may not need some large files on your workstation. The list below gives file names relative to root, but remember that if you are using Miniroot

Installation, */root* must be prepended to each of the file names if you escape to the shell with *sh*. If you escape to the shell with *shroot* or are using IRIX Installation, use the file names as given.

- Kernel core dump files in */usr/adm/crash/vmcore** and */usr/adm/crash/unix**.
- Files put into */lost+found* and */usr/lost+found* by *fsck(1M)*.
- If you have process accounting enabled, the directories *fiscal*, *nite*, and *sum* in */usr/adm/acct* may contain large files.
- */usr/adm/SYSLOG*. If this file is very large, you may want to truncate it. It is in use, so you have to kill *syslogd(1M)*, remove the file, and restart *syslogd*.
- Unnecessary files in */tmp* and */usr/tmp*. Note that */usr/tmp/inst.a** files are temporary files created by *inst* and should not be removed.
- Core files. You can find all core files in the root and user file systems with these commands if you are using Miniroot Installation:

```
Admin> shroot
# /bin/find / /usr -mount -name core -print
```

- Large user files that can be temporarily archived to tape. One way to find large files is to use the *sysadm(1)* command if it is installed (*sysadm* is not included in Release 5.0 and later):

```
% /bin/su -
Password:
# /usr/bin/sysadm filesize
```

```
Running subcommand 'filesize' from menu 'filemgmt',
FILE MANAGEMENT
```

```
Enter full path name of the directory to search
[?, q]: /usr/people/joe
Enter the number of large files to be included in list
(default 10 largest) [q]: 10
```

```
The largest 10 files in /usr/people/joe:
(report)
```

If your site uses NFS, you may be able to NFS-mount manual pages installed on another workstation rather than installing them on your workstation when disk space is scarce.

Replacing your system disk with a larger disk is sometimes an option when you need more disk space in order to install the software you want. NFS mounting remote file systems is not an option when you need more disk space, because *inst* does not install software on NFS-mounted file systems.

8.4.1.6 If You See This Error Message ...

INCOMPATIBLE SUBSYSTEMS

The following subsystem(s) cannot be installed they are incompatible with software currently installed. Use "help incompatible" for more information.

(list of subsystems)

*incompatible
subsystems*

Possible Causes Are ...

You are trying to install subsystems that are incompatible with each other or are incompatible with already installed subsystems. Both subsystems cannot be installed.

What You Should Do Is ...

Change your installation selections or remove already installed software. The message lists the compatibility problems. Some hints are:

- Use the `files` command on the Administrative Commands Menu to list the files in each of the subsystems to help you decide which subsystems you need.
- Your problem may be a version problem if the incompatible subsystems are from two different products. Installing the products in the opposite order might solve it.

8.4.1.7 If You See This Error Message ...

INST CORE DUMP

An error has occurred during your installation session and the `inst` program has core dumped. Copies of `inst` and the core file have been saved in `/root/usr/tmp/inst` and `/root/usr/tmp/inst.core`.

You may be able to proceed with the installation by re-invoking `inst` and continuing the installation process. To do this, answer "n" to the restart question below. If you answer "y" to the restart question, the system will attempt to boot the UNIX kernel in `/unix`. In either case, your system has been left in an unknown state and re-installation of the software you were trying to install is recommended.

Ready to restart the system. Restart? [y, n]

Possible Causes Are ...

- A bug in *inst*.
- Corruption of the installation history database has occurred that *inst* was not able to detect and recover from. This corruption could be the result of modifications by a user or a CPU or disk hardware problem.

What You Should Do Is ...

Follow these steps:

1. If you were using IRIX Installation, invoke *inst* again by giving the same *inst* command line at the shell prompt again.
2. If you were using Miniroot Installation, invoke *inst* again, but you do not need to copy the miniroot into the swap partition again. At the Command Monitor prompt, give this command if your system disk has the default partition configuration:

```
>> <drive>(0,<unit>,1)unix.<cpu>
```

where *<cpu>* is your CPU value from *hinv*(1M). (You can give the *hinv* command at the >> prompt if necessary, see Section 7.1, "Loading the Miniroot from the Command Monitor.") The values of *<drive>* and *<unit>* depend on what type of drive your system disk is. If you have custom configured your system disk, the command to reinvoke the copy of *inst* that is already in your swap partition will vary.

Drive Type	<drive>	<unit>
SCSI	dksc	1
ESDI	dkip	0
SMD	xyl	0
IPI	ipi	0

Table 8-3 Disk Drive Types with *<drive>* and *<unit>* Values

3. Using either installation method, you should now see the Inst Main Menu. The default location of new software might not be correct, so change it back to the distribution source you were using prior to the core dump if necessary:

```
Inst> from $dist
```

4. Display the values of the `set` options with the command:

```
Inst> set
```

Check the values of any options that you changed in your last `inst` session because they probably have their old values again. You can change them with the `set` command if necessary.

5. Give the `list` command and check the selection and installation status of the subsystems carefully and modify as necessary. Only those images that were completely installed when the core dump happened will be marked as installed. If you want to reinstall subsystems just to make sure, select them for installation.
6. Proceed with subsystem selection and installation. Try choosing different commands (`install` instead of `step`, for instance) to avoid the problem that caused the core dump.
7. If the core dump happened during the reading of the installation history database, work around the problem by moving the files in `/usr/lib/inst` to another directory. This can be done before invoking `inst` or by escaping to the shell immediately after `inst` is invoked. The drawbacks to this workaround are:
 - All disk space requirements numbers will be wrong until all currently installed subsystems are replaced.
 - The output from `versions -c` and `versions config` will be missing some configuration files permanently.
 - Obsolete files (files that have no replacement in the new release) will not be removed. You can use `find(1)` to find them and then remove them, but make sure that they are not configuration files or user files.

In spite of these drawbacks, moving `/usr/lib/inst` files is a better workaround to this type of problem than the much more drastic and harder-to-recover-from workaround of remaking file systems with `mkfs`.

8.4.1.8 If You See This Error Message ...

(error messages may appear here)

```
INST TERMINATION ERROR
```

An error has occurred during your installation session and the `inst` program has terminated abnormally.

You may be able to proceed with the installation by re-invoking *inst* and continuing the installation process. To do this, answer "n" to the restart question below. If you answer "y" to the restart question, the system will attempt to boot the UNIX kernel in */unix*. In either case, your system has been left in an unknown state and re-installation of the software you were trying to install is recommended.

Ready to restart the system. Restart? [y, n]

***inst* termination
error**

Possible Causes Are ...

- The software distribution has been disturbed or removed. For example, your tape or CD might have been removed during installation.
- If the error message below is displayed, one of the directories */usr*, */usr/lib*, or */usr/lib/inst* has been symbolically linked to another directory with an absolute path, or *inst* does not have write permissions for these directories. Since file systems are mounted under */root* in the miniroot, *inst* is not able to follow the link and cannot create its lock file. Similarly, if it isn't able to create its lock file because it can't write it, it fails.

```
Can't create lock file /root/usr/lib/inst/inst.lock: Not a directory
inst: cannot proceed with installation
```

What You Should Do Is ...

- Reinvoke *inst* and reinstall your software by following the directions in Error 8.4.1.7.
- Reinvoke *inst* and as your first command, give the *sh* command. Either correct the directory permission problem, or link the dangling link to an existing directory.

8.4.2 Messages Followed by the Interrupt/Error Menu

Every error that causes the Interrupt/Error Menu to be displayed is discussed in this section.

8.4.2.1 If You See This Error Message ...

`inst: network timeout on <user>@<source>. See "help timeouterror".`

- | | |
|------------------|---|
| 1. stop | Terminate current command |
| 2. continue | Continue current command |
| 3. set [options] | List all options or set/clear [options] |
| 4. help [topic] | Get help in general or on a specific word |

Interrupt>

network timeout Possible Causes Are ...

inst had established a connection with the remote workstation, but during one of its read operations, it was unable to get any blocks for a period of time.

What You Should Do Is ...

Give the command `stop` at the `Interrupt>` prompt. You'll get the Inst Main Menu again. You should increase the value of `timeout` as discussed in Error 8.4.3.3, then proceed with the installation (usually giving the `go` command at the `Inst>` prompt). In this situation it is very important that you do *not* give the `continue` command at the `Interrupt>` prompt.



8.4.2.2 If You See This Error Message ...

`inst: error at <filename>. See "help syncerror" for more information.
(Interrupt/Error Menu)`

syncerror Possible Causes Are ...

The installation database file for the product you are attempting to install and the image file that *inst* is reading do not match. This can happen when the software distribution is corrupted or there was a read error.

What You Should Do Is ...

Try the operation again by giving the `stop` command followed by `go`. If it fails again, a portion of the distribution is probably corrupted.

You can try to work around the problem by deselecting all of the subsystems in the image where the failure occurred and proceeding with the installation.

If you are using a distribution directory, check to see if the contents of the directory have changed during your installation. If this is the case, you can recover by giving the command **from \$dist**, checking the new installation selections and continuing with the installation.

8.4.2.3 If You See This Error Message ...

```
[Aux Cmd] <shell_command>  
sh: <error_message>  
(Interrupt/Error Menu)
```

Aux Cmd error

Possible Causes Are ...

The internal installation specification for the subsystem currently being installed includes executing certain commands called auxiliary commands after the files in the subsystem are installed. One of these auxiliary commands failed.

What You Should Do Is ...

You should note the *<shell_command>* that failed, because it might provide clues if you later discover problems that may be installation related. You should choose *continue* at the *Interrupt>* prompt. If that doesn't solve the problem try *continue* again. If it fails again use *stop* to get back to a menu, check your installation selections, and proceed.

8.4.2.4 If You See This Error Message ...

```
volume header  
dvhtool entry problem  
(Interrupt/Error Menu)
```

volume header error

Possible Causes Are ...

inst is attempting to add an entry to a file system volume header, but the volume header is full. The volume header contains information about the location and length of certain programs used in standalone mode. The new entry may be for an existing program, and the solution is to delete the existing entry using the *dvhtool(1M)* program.

What You Should Do Is ...

Use *dvhtool*(1M) to examine the contents of the volume header (as shown below). The programs (<program>) *sgilabel* and *sash* are essential on all workstations and cannot be removed with the *dvhtool* *d* command. On IP6, IP12, IP20, and IP22 workstations (get the CPU type from *hinv*), the program *ide* is also essential (*ide.IP20* is used for IP22 as well as IP20). A good candidate for removal if present is the kernel debugger program *symmon*.

Give these commands:

```
Interrupt> stop
Inst> sh
# /etc/dvhtool
Volume? (/dev/rvh) <Enter>

Command? (read, vd, pt, dp, write, bootfile, or quit): vd
(d FILE, a UNIX_FILE FILE, c UNIX_FILE FILE, g FILE, UNIX_FILE or l)?
  1

Current contents:
      File name      Length      Block #
      sgilabel       280         414
      symmon         156160      416
      ide             500224      721
      sash           200704      1698

(d FILE, a UNIX_FILE FILE, c UNIX_FILE FILE, g FILE, UNIX_FILE or l)?
  d <program>

(d FILE, a UNIX_FILE FILE, c UNIX_FILE FILE, g FILE, UNIX_FILE or l)?
  q

Command? (read, vd, pt, dp, write, bootfile, or quit): q
# exit
Inst> go
```

8.4.3 Messages that Begin with “inst:” (No Interrupt/Error Menu)

Error messages that begin with “inst:” are discussed in this section with one exception. If the Interrupt/Error Menu is displayed after the “inst:” message, then the error is discussed in Section 8.4.2.

8.4.3.1 If You See This Error Message ...

(possibly there will be additional error messages here)

inst: remote connection to <user>@<source> timed out. See "help timeouterror".

*remote connection
timed out*

Possible Causes Are ...

inst was trying to make the initial connection to the remote workstation but failed because the connection wasn't established within the timeout period.

What You Should Do Is ...

Follow the instructions in Error 8.4.3.3.

8.4.3.2 If You See This Error Message ...

(other messages will probably appear before the message below)

inst: bad network connection to <user>@<source>. See "help networkerror".

network error

Possible Causes Are ...

inst was able to establish a network connection to the remote workstation, but a failure occurred while it was trying to open a file or read a directory.

What You Should Do Is ...

- Try your last command again.
- Use the network diagnostic procedures in Section 8.2.2.

8.4.3.3 If You See This Error Message ...

<server>: connection timed out
inst: can't read software. See "help readerror".
cannot open <filename>

network timeout

Possible Causes Are ...

The connection to the remote workstation <server> timed out when *inst* was attempting to establish the connection or open a file or directory.

What You Should Do Is ...

Check your network using the procedure in Section 8.2.2.

If your network appears to be working, use the `set` command find out what the current network timeout value is (at any *inst* prompt):

```
Inst> set
```

The output contains the values of all of the `set` options; look for the value of `timeout`. Then use `set` again to set a new, larger timeout value:

```
Inst> set timeout <number>
```

where *<number>* is the new timeout value in seconds. It is typically in the range of 180 to 300.

8.4.3.4 If You See This Error Message ...

```
Remote connection to <user>@<server> fails:  
interrupted system call.  
inst: can't read software. See "help readerror".
```

*interrupted system
call*

Possible Causes Are ...

inst failed to establish the remote connection, possibly because you interrupted the last command with `<ctr1-c>` or the remote workstation went down.

What You Should Do Is ...

- Try your last command again.
- Use the network diagnostic procedures in Section 8.2.2.

8.4.3.5 If You See This Error Message ...

```
inst: unrecognized product structure. Use newer version of inst  
while reading product descriptions,
```

*unrecognized
product structure*

Possible Causes Are ...

The version of *inst* you are using is incompatible with the software distribution you are trying to use.

What You Should Do Is ...

Quit out of *inst*, install a later system software release, then try installing the software distribution that gave you the error again.

8.4.3.6 If You See This Error Message ...

```
Permission denied
inst: can't read software. See "help readerror".
```

permission denied

Possible Causes Are ...

- You are experiencing a *tftp* problem, see Section 3.2.
- You are trying to use a user ID on a remote workstation that is protected by a password.

What You Should Do Is ...

- Follow the directions in Section 3.2 to remove the *tftp* security.
- Follow the directions in Section 3.3 to modify a user ID protected by a password so that it can be used for installations.
- Use a user ID on the remote workstation that does not have a password. See the discussion of *<user>* in Section 10.2, "from Arguments."

8.4.3.7 If You See This Error Message ...

```
dd: read error: I/O error
<n>+<m> records in
<n>+<m> records out
inst: can't read software. See "help readerror".
```

while using a local or remote tape drive,

dd read error

Possible Causes Are ...

- No tape is in the tape drive.
- The tape-drive heads are dirty.
- The tape is not rewound to the beginning of the tape.
- You have a faulty copy of the software distribution tape.

What You Should Do Is ...

- Use the procedures in Section 8.2.3 to identify the source of the problem.
- Use the procedures in Section 8.2.4 to retension the tape and clean the tape drive heads.
- If you are able to find a workaround for your problem such as using a tape drive on another workstation, you can use the *from* command to

tell *inst* the new software distribution location and/or force it to read the tape again.

8.4.3.8 If You See This Error Message ...

(error messages)

`inst: can't read software. See "help readerror".`

can't read software

Possible Causes Are ...

- You've specified a distribution directory that doesn't exist.
- The product description file is missing from the distribution directory.
- The software distribution tape, CD or directory doesn't contain a software distribution in the correct format. This can happen if you try to read a software distribution that was prepared for a later version of *inst* than the version you are using.

What You Should Do Is ...

Examine the error messages prior to the **inst:** message for hints about which of the possible causes is most likely to be your problem. You should also give the **set** command and look at the value of **dist** to make sure you've given the correct distribution source.

8.4.3.9 If You See This Error Message ...

`inst: can't read software (CD-ROM may not be mounted). See "help readerror".`

*CD-ROM not
mounted*

Possible Causes Are ...

- The same as Error 8.4.3.8.
- The CD-ROM drive may not be mounted.

What You Should Do Is ...

Go to the Administrative Commands Menu and try to mount the CD-ROM drive:

```
Admin> mount -o ro /dev/dsk/dks<cntrl>d<unit>s7 /CDROM
```

If the mount is successful, go back to the Inst Main Menu and give the **from** command:

```
Inst> from $dist
```

If this is not successful, use the procedures in Section 8.2.5 to diagnose and solve the problem.

8.4.4 Other Error Messages (No “inst:”)

Errors that don't have capitalized titles, don't cause the Interrupt/Error Menu to be displayed, and don't contain “inst:” are discussed in this section.

8.4.4.1 If You See This Error Message ...

`unable to access <server>`

unable to access

Possible Causes Are ...

- The remote workstation is not up and running IRIX.
- It isn't possible to access the remote workstation from your workstation.

What You Should Do Is ...

Check that the remote workstation is up and running.

Bring up your workstation under IRIX and try accessing the remote workstation using the procedure in Section 8.2.2.

8.4.4.2 If You See This Error Message ...

`no space left on device`

`while reading from tape.`

no space on device

Possible Causes Are ...

- The tape might contain only Installation Tools and no products.
- You might be reading a 150MB tape on an incompatible (QIC 24) tape drive.

What You Should Do Is ...

- Take the tape out of the drive and look at the label to see what it contains. If it contains only Installation Tools, put your next tape in the tape drive and continue with the installation by giving the `list` command.
- Use the procedure for checking tape and tape drive compatibility in Section 8.2.3.

8.4.4.3 If You See This Error Message ...

cannot compute disk space

*can't compute disk
space*

Possible Causes Are ...

An NFS-mounted file system is stale. (This typically happens only during IRIX Installation.)

What You Should Do Is ...

Use *df(1)* to check for a stale file system. If there is a stale file system, unmount it and mount it again, either by escaping to a shell or by using the shell in another window.

8.4.4.4 If You See This Error Message ...

<subsystem>: can't install over NFS mounts, installation request rejected

*can't install over
NFS*

Possible Causes Are ...

One or more of the destination directories for the files in *<subsystem>* are NFS mounted.

What You Should Do Is ...

- Use the command **keep** *<subsystem>* to deselect *<subsystem>* for installation.
- If you are using IRIX Installation, unmount the NFS-mounted file system from IRIX (not from within *inst*), and continue with the installation.
- If you are using Miniroot Installation, use the *umount* command on the Administrative Commands Menu to unmount the NFS-mounted file system, and then continue with the installation.

To update the software in the NFS-mounted directories, you will have to install *<subsystem>* locally on the workstation with the file systems that have been NFS mounted.

8.4.4.5 If You See This Error Message ...

dks0d1s<partition>: out of space

Possible Causes Are ...

- *inst* ran out of disk space in the miniroot (swap partition) because it didn't have enough disk space to store information about disk usage for the large number of products in the software distribution.
- *inst* ran out of disk space in the miniroot because it was restarted. There wasn't enough disk space to store disk usage information for the first and second times *inst* was started.
- The root file system (/) ran out of disk space because */usr* wasn't mounted (possibly because it was marked dirty) and / got filled up.
- The / or */usr* file system got filled up during installation in spite of *inst*'s calculation that there would be enough disk space.

What You Should Do Is ...

1. Determine which partition ran out of disk space: *<partition>* 0 is the root filesystem, *<partition>* 1 is swap, and *<partition>* 6 is the */usr* file system.
2. If *inst* ran out of space in the swap partition and was restarted while still in the miniroot, start up IRIX, then shut down the system, and load the miniroot again.
3. If *inst* ran out of space in the swap partition and was not restarted, start up IRIX, shut down the system, and load the miniroot again. After *inst* comes up, give the *from* command and specify just a single product, such as *eoel* (see Section 10.2). Install this product, then give the *from* command again for another product that requires Miniroot Installation, such as *eoel2*. After all products that require Miniroot Installation have been installed, switch to IRIX Installation for any remaining products.
4. If *inst* ran out of space in the root partition, confirm that the */usr* filesystem was mounted by checking the output of the *list* command (see Section 10.5). If it is not mounted, mount it, and proceed with the installation.
5. If *inst* ran out of space in either the root or */usr* filesystems and it appears that you may have requested more software than will fit, select fewer subsystems and/or install just a few at a time (when subsystems grow substantially in size from one release to the next, there may not be enough disk space part way through the installation).

8.4.4.6 If You See This Error Message ...

<subsystem>: not selected for installation because it is not compatible with this machine. See "help incompatible".

not compatible

Possible Causes Are ...

The subsystem you have selected for installation, <subsystem>, is not compatible with your workstation's hardware configuration.

What You Should Do Is ...

Review the *Release Notes* for the product you are trying to install to learn about the hardware configuration restrictions for this subsystem.

8.4.4.7 If You See This Error Message ...

(unknown product)
(unknown image)
(unknown subsystem)

in the output of the *versions* or *versions(1M)* command,

unknown subsystem

Possible Causes Are ...

- Installation history information in */usr/lib/inst* was removed by a user.
- File system corruption has damaged installation history files.

What You Should Do Is ...

Nothing. These messages can safely be ignored. The messages are replaced by descriptions if you reinstall the software.

8.5 Problems While Finishing Up Installation

Error messages that occur while performing the procedures in Chapter 6, "Finishing Up Installation," are discussed in this section.

8.5.1 If You See This Error Message ...

PENDING INSTALLATION/REMOVAL REQUESTS

There are "install" and/or "remove" requests that have not yet been performed by the "go" command. Type "yes" if you want to quit anyway. If you want to perform these operations, type "no" and then give the "go" command. If you want more information, type "no", and then "help quit".

pending requests **Possible Causes Are ...**

You have selected subsystems for installation or removal but have not yet installed them with the `go` command. The most recent command you've given is `quit`, and *inst* wants to warn you that you may have forgotten to give the `go` command.

What You Should Do Is ...

- If you forgot to give the `go` command, type **no** in response to the question, then give the `go` command. After the installation is successful, give the `quit` command again.
- If you are intentionally exiting *inst* without installing and/or removing your selections, type **yes** and *inst* will continue with the exiting process.

8.5.2 If You See This Error Message ...

ERROR IN KERNEL CONFIGURATION

The UNIX kernel is not properly installed on the system, probably as a result of an `autoconfig(1M)` failure.

To correct the problem, return to *inst* by answering "n" to the restart question below, then give the command "help kernelerror" to get more information that will help you diagnose and solve the problem.

If you answer "y" to the restart question below, the system may not come up properly, or the system may come up running an old kernel that might be incompatible with the new software you just installed.

Ready to restart the system. Restart? [y, n]

**kernel
reconfiguration error**

Possible Causes Are ...

- The system date is incorrect and has prevented kernel reconfiguration from working properly.
- Incompatible kernel drivers have been installed or old kernel drivers weren't properly removed.
- There was insufficient disk space for reconfiguring the kernel.

What You Should Do Is ...

1. Answer **n** to the Restart? question in order to bring up the Inst Main Menu again.

2. Check the system date with the `date` command:

```
Inst> admin date
```

3. If the date isn't correct, use the `date` command to set the date, and reinstall the subsystems that are marked with @ (miniroot installation required). The command sequence would look something like this:

```
Inst> admin date <mmddhhmmyy>
```

```
Inst> list
```

```
Inst> install <subsystems with @>
```

```
Inst> go
```

4. Check the free disk space on the / file system:

```
Inst> admin space
```

If you have fewer than 2000 free blocks, follow the suggestions in Error 8.4.1.5 for getting more disk space, and then try the `quit` command again.

5. Look for obsolete kernel files by giving these commands:

```
Inst> shroot
```

```
# ls -ltR /usr/sysgen
```

Look for files with modification dates that indicate that they may have been included in an earlier release. If they are incompatible with the software you just installed, they could be causing the error in kernel reconfiguration.

6. Rename any old files that you find and then exit the shell:

```
# mkdir old
# mv <old files> old
# exit
Inst>
```

7. Give the quit command again:

```
Inst> quit
```

8.5.3 If You See This Error Message ...

```
[Aux Cmd] <shell_command>
sh: <error_message>
```

Aux Cmd error

Possible Causes Are ...

The internal installation specification for the subsystem currently being installed includes executing certain commands called auxiliary commands after the quit command is given. One of these auxiliary commands failed.

What You Should Do Is ...

You should note the command that failed for later use in case a problem develops. Continue with finishing up the installation.

8.6 Problems without Error Messages

This section covers problems that don't have error messages associated with them. Problems during all phases of installation are covered.

8.6.1 If You Have This Problem ...

The copyright message and the Inst Main Menu don't appear after copying the miniroot to the swap partition.

inst doesn't come up Possible Causes Are ...

Copying the miniroot from the software distribution source to the swap partition was not successful.

What You Should Do Is ...

1. Use the Reset button on the main workstation unit and give the commands to get back to the Command Monitor prompt >>.
2. Give the *hinv* command and check the CPU type of your workstation to make sure that the value of *<cpu>* that you gave is correct for your workstation.
3. Give the *dksc* or *setenv* and *boot* commands again.

8.6.2 If You Have This Problem ...

inst doesn't respond to *<ctrl-c>* interrupts.

inst doesn't respond to interrupts Possible Causes Are ...

- *inst* is performing an operation that is not interruptible. Examples are certain tape operations, calculating disk space, copying files, and executing auxiliary commands.
- *inst* is terminating the current operation, but it is taking a few minutes to do so.
- You are using a remote distribution source and the remote workstation has been shut down.

What You Should Do Is ...

- Wait a few minutes for the current operations to finish up.

- Check to see if the remote workstation is still up. If it is not up, and you are using IRIX Installation, give the *kill(1)* command from another shell or another workstation to kill *inst*. If you are using Miniroot Installation, press the Reset button on your workstation main unit and start your installation again.

8.6.3 If You Have This Problem ...

inst echoes keys, but does not respond to any commands.

inst doesn't respond to commands

Possible Causes Are ...

The remote workstation that contains your distribution source has gone down.

What You Should Do Is ...

1. Check the remote workstation to make sure it is running. Bring it up if you plan to continue using it.
2. Bring up *inst* again on your workstation, possibly using a different remote workstation for your distribution source.

8.6.4 If You Have This Problem ...

The Inst Main Menu comes up when you expected IRIX to come up.

inst instead of IRIX

Possible Causes Are ...

An installation session terminated abnormally.

What You Should Do Is ...

Use *quit* to exit *inst* and answer **yes** to the *Restart?* question. If this doesn't work, use the standalone version of *fx(1M)*. See Error 8.3.14 also.

8.6.5 If You Have This Problem ...

Your workstation hangs during the reboot process.

hangs during reboot

Possible Causes Are ...

You exited the installation process without doing a *quit* (possibly by pressing the Reset button). This can result in your root partition being incorrectly mounted.

What You Should Do Is ...

Try to reinvoke the miniroot that is already loaded in your swap partition using the procedure in Error 8.4.1.7. If that fails, reload the miniroot using an appropriate procedure in Section 4.7, "Invoking *inst.*"

8.6.6 If You Have This Problem ...

The window system doesn't come up after restarting your workstation. You might see a black screen with a Silicon Graphics logo and the light blue screen with the gray textport flash back and forth.

no window system

Possible Causes Are ...

Your workstation doesn't have necessary window system subsystems installed.

What You Should Do Is ...

Check the *Standard System Release Notes* to see if additional subsystems are required. In particular, you should install *ee2.sw.4Dwm* if it isn't installed.

8.7 Calling Your Support Organization

In the United States, the number for the Silicon Graphics Technical Assistance Center is 1-800-800-4SGI. Your organization must have an appropriate support contract with Silicon Graphics in order to take advantage of this service. The *Release Notes* for the products you are trying to install may include a telephone number for a different support organization.

If you have read the troubleshooting information in this chapter and still need help, you should have this information available when you call your support organization:

- The serial number of your workstation (required)
- The products that you are trying to install and their release numbers (see the tape or CD labels)
- The release numbers of software products that are currently installed (use *versions(1M)*)
- The type of software distribution you are using (local or remote tape, CD-ROM, or distribution directory)
- The text of any error messages you have seen
- The hardware configurations of your workstation and any remote workstation used for installation (model numbers, the size of your system disk, etc.)



Installation Strategies

This chapter explains how to approach various installation situations, for example, maintenance releases, starting with an empty disk, and installing software after a hardware upgrade.

Installation Strategies

The installation procedures described so far in this book have been generic; they apply to all types of installation tasks from installing a new software option, to installing a system software release, to installing a maintenance release. *inst* does not distinguish these tasks, nor does it function differently depending on the product that is being installed (with the exception of Maintenance Release products, which are discussed below).

However, you have specific products that you want to install and tasks that you want to perform. In this chapter, sections discuss each type of installation task that you might want to perform. These discussions highlight the issues that are specific to these tasks and give tips on some of the choices you need to make during the installation process. They assume that you are familiar with the installation procedures in Chapter 4, "Bringing Up *inst*," Chapter 5, "Using *inst*," and Chapter 6, "Finishing Up Installation."

The sections in this chapter are:

- 9.1, "Installing Software Options"
- 9.2, "Installing Manual Pages"
- 9.3, "Installing a Maintenance Release"
- 9.4, "Installing a Software Update"
- 9.5, "Installing onto an Empty Disk"
- 9.6, "Installing onto a Disk for Another Workstation"
- 9.7, "Installing Software for a Diskless Workstation"
- 9.8, "Installing Software for Hardware Upgrades"
- 9.9, "Reinstalling an Older Software Release"

9.1 Installing Software Options

software option

Software options are software catalog items that you can purchase, for example the Fortran 77 Compiler and the Network File System. You can receive software options with your new workstation, when you've purchased them separate from your workstation purchase, and when a new version of an option you already have has been released. When you want to install a software option, some hints for installing this type of Software Product Release are:

- Check the *Release Notes* for the software option to see if you must use the Miniroot Installation method. If not, IRIX Installation is easier, but when in doubt use Miniroot Installation.
- If the software option requires Miniroot Installation, use the Installation Tools that came with the version of *eoel* that is installed on your workstation, or if you have a Maintenance Release installed that came with Installation Tools, use those Installation Tools.
- If you have several software options to install and they are on more than one tape, CD or distribution directory, use their sequence numbers or information in their *Release Notes* to determine the installation order. If you guess and get it wrong, *inst* lets you know when you give the `go` command.
- If you have a Maintenance Release installed on your workstation and you are not installing new versions of *eoel* and *eoel2* at the same time as you install software options, you may have to reinstall that Maintenance Release after you install the Software Product Releases. The *Release Notes* for the Maintenance Release tell you if it includes *maint* subsystems for the subsystems you just installed, or you can do a `list` of the Maintenance Release while you are using *inst*. If the Maintenance Release includes maintenance subsystems for the subsystems you just installed, you should reinstall the Maintenance Release. *inst* does the selection of the correct subsystems automatically.

9.2 Installing Manual Pages

The following conventions are used for manual pages:

- Manual pages for the software in each product are in that product. For example, all of the manual pages and software for the Network File System software option are in the product *nfs*.
- Manual pages are in subsystems that consist exclusively of manual pages. The image name portion of the name always includes the letters "man". For example, *dev.man.lib*.
- Software subsystems usually have a corresponding subsystem that contains the manual pages for that software. In this case, the names of the subsystems differ only in the image portion of the name.
- Some manual page subsystems contain manual pages for more than one software subsystem.
- If a product has *Release Notes*, one additional subsystem in that product has "man" in its image name: the release notes subsystem, **.man.relnotes*.

When you receive your workstation and when you install a software option for the first time, be sure to check the status of manual page subsystems and verify that the manual pages you want are installed.

Useful commands for checking and installing manual page subsystems are given below.

- Check to see what manual page subsystems are installed:

```
# /usr/sbin/versions '.*man'
```
- List all manual page subsystems available for installation:

```
Inst> list *.*man*
```
- Select all manual page subsystems, but not release notes for installation:

```
Inst> install *.*man*  
Inst> keep *.*relnotes
```

9.3 Installing a Maintenance Release

This section discusses what to do when you want to install a Maintenance Release. You may have received a Maintenance Release through a support contract, along with a new hardware option, or as a result of discussing a problem with the Technical Assistance Center.

Maintenance Releases have some characteristics that are quite different from Software Product Releases. These characteristics are listed in Section 2.2.2, "Maintenance Releases," and it will be helpful for you to review them before you begin installing a Maintenance Release.

Some Maintenance Releases include Installation Tools and some do not. If Installation Tools are included, you must use the Miniroot Installation method and the Installation Tools that came with the Maintenance Release.

In several situations when you receive a Maintenance Release, you should follow the directions in other sections of this chapter:

- If you have Software Product Releases to install along with the Maintenance Release, you should use Section 9.4, "Installing a Software Update," instead. Using the sequence numbers to order your software distributions will guarantee that the Maintenance Release is installed last, which is important. When you install the Maintenance Release distribution(s), let *inst* do the subsystem selection.
- For some hardware options, such as those that upgrade your CPU or graphics, you may need to follow the instructions in Section 9.8, "Installing Software for Hardware Upgrades," instead. The documentation that comes with the hardware and Maintenance Release should help you decide which procedure to follow. When in doubt, follow the procedure in Section 9.8.
- If you received a Maintenance Release (a release whose number has two periods, as in 4D1-4.0.5F), but the product names do not begin with *maint*, you should follow the directions in Section 9.4. In this case, a Software Release has been rereleased with files that were included in a subsequent Maintenance Release so it is a complete set of files rather than a few files that contain bug fixes.



When installing a Maintenance Release, you should always let *inst* do the selection of subsystems. *inst* automatically selects only the *maint* subsystems that update the subsystems already installed on your workstation which is exactly what you want.

When installing a Maintenance Release, the typical sequence of *inst* commands is *from* if you need it, *list* if you want to see what's in the Maintenance Release and what *inst* has selected, and then *go*, (no *install*, *remove*, *keep*, or *step*). For example:

```
Inst> from <source>
Inst> list
(list output)
Inst> go
```

If you have turned the set option *autoselect* off, temporarily set it on to install the Maintenance Release:

```
Inst> set autoselect on
Inst> from <source>
Inst> list
(list output)
Inst> go
Inst> set autoselect off
```

where *<source>* is your software distribution source. When you are temporarily setting *autoselect* on, you must use *from* even if *inst* already knows the correct distribution source. Rather than specifying *<source>* as shown in Table 10-3, you can use a shortcut:

```
Inst> from $dist
```

\$dist stands for the value of the set option *dist*. This option is automatically set to *<source>* every time a distribution source is read.

If you receive a software distribution tape or CD that has both base and maintenance products on it, or if you create a software distribution directory that has both base and maintenance products, follow this procedure for using the software distribution:

1. Install the base subsystems you want as usual.
2. Before changing software distributions or quitting *inst*, give the *list* command. *maint* subsystems that match base subsystems that you just installed are automatically selected.
3. Give the *go* command to install the *maint* subsystems.



inst restricts the installation and removal of *maint* subsystems. It does not let you install a *maint* subsystem for a subsystem that is not already installed. It also won't let you remove a *maint* subsystem with the `remove` command. This is because removing a *maint* subsystem leaves you with a subsystem that is missing some files. *maint* subsystems are automatically removed when the next applicable Maintenance Release or Software Product Release is installed.

9.4 Installing a Software Update

When you receive a software update, you might receive one or more software distributions. Installing this software in the correct order is very important. Use the sequence numbers on the tape or CD labels or the directions in Section 4.4, "Deciding the Installation Order of Software Distributions," to determine the order in which you should install tapes, CDs, or distribution directories. You won't necessarily receive updates for all of the products on your workstation since not all products are updated at the same time.

When you install a software update, it is important to replace or remove all, not just some, of the older subsystems in each product you install. If you have subsystems of a product from two different releases on your workstation simultaneously (use *versions(1M)* with the `-n` option to detect this), you should expect compatibility problems which can be very difficult to diagnose.

When *inst* makes its initial installation selections, it automatically selects the new versions of subsystems that are already installed. In addition, it selects subsystems that are new in this release and are marked with * in `list` output. Subsystems that you have previously rejected (with or without a *) are not selected for installation. In many cases, you can examine the selections with `list` and give the `go` command without making any selection changes.

If you see a message about changed configuration files after you give the `quit` command, you should follow the directions in Section 6.2, "Returning to IRIX and Finishing Up," for merging configuration files. You will see a message about changed configuration files the next 13 times you reboot your workstation if you don't.

9.5 Installing onto an Empty Disk

If you've replaced your system disk drive, reformatted your disk in order to map out bad sectors, repartitioned the disk, used *mkfs(1M)* from IRIX, or used *mkfs* from the *inst* Administrative Commands Menu and erased the contents of your / and */usr* file systems, you are now faced with the task of installing software onto an empty disk.

Before you can install software on an empty disk, the disk must have at least / (root) and swap partitions.

If the disk does not have / and swap partitions, use the standalone version of *fx(1M)* to partition the disk (see Error 8.3.14 and the *fx(1M)* manual page). */usr* can be part of the root file system or it can be a separate file system. Normally it is a separate file system.

You must use Miniroot Installation. While you are following the procedure for bringing up *inst*, be sure to get the IP address of the remote workstation if you are using one, and to verify that *netaddr* is set to the correct IP address for your workstation.

The initial subsystem selections that *inst* makes are those subsystems marked with * in *list* output. Since your disk is empty, *inst* has no memory of what was installed or rejected during past installations. You can use *inst* as usual to select subsystems for installation and use *go* to perform the actual installation.

After you give the *quit* command, you won't see messages about changed configuration files. However, you might want to edit some of the configuration files because they do not contain any local modifications. In particular, */etc/sys_id* contains the name "IRIS," and */etc/hosts* contains the IP address "192.0.2.1". To get a list of the configuration files, log in to IRIX and give this command:

```
# /usr/sbin/versions config
```

9.6 Installing onto a Disk for Another Workstation

This section discusses installing software on a disk and then moving that disk to another workstation. The disk becomes the system disk on the other workstation.

The disk drive that you want to install software on must have a / (root) partition mounted as an EFS file system at `<mountdir>`. If it has a `/usr` partition, mount the user partition at `<mountdir>/usr`. If you don't create a user partition at `<mountdir>/usr`, `inst` creates a `<mountdir>/usr` directory. The disk can also have a swap partition, but it is not required when the workstation will be configured so that swap is on another disk.

You must use the IRIX Installation method. If the model number and graphics type of the workstation for which the disk is destined are the same as the workstation on which you are doing the installation, invoke `inst` with this command:

```
# /usr/sbin/inst -f <source> -r <mountdir>
```

The optional `-f <source>` argument specifies the location of the software distribution source. It can have the value `<source>` or `<source>/<product>`. See Section 10.2, "from Arguments" for the syntax.

If the workstation that is getting the disk has different hardware, you may need to give one or more `-m` options on the `inst` command line:

```
# /usr/sbin/inst -f <source> -r <mountdir> -m <hardware>=<string> ...
```

`<hardware>` is "CPUBOARD", "GFXBOARD", or "SUBGR". You might need to give four `-m` options, one for each `<hardware>` value. If you specify less than four `<hardware>` values on the command line, the remainder default to the values for the workstation you are using.

Follow this procedure to get the values for CPUBOARD, GFXBOARD, and SUBGR:

1. Get the CPU type of the workstation that is to get the new disk by giving the `hinv(1M)` command or the `hinv` Command Monitor command on that workstation as explained in Section 7.2, "Getting the CPU Type of a Workstation." The CPU type is the value for CPUBOARD. It is also the value of `<cpu>` in Table 9-1.

<i>hinv</i> Output	<cpu>	GFXBOARD	SUBGR
Graphics board: GR1*	IP6, IP12	ECLIPSE	ECLIPSE
Graphics board: GR2-*	IP12, IP20	EXPRESS	EXPRESS
Graphics board: GR2-*	IP17	EXPRESS	IP17
Graphics board: GR3-*	IP22	EXPRESS	EXPRESS
Graphics board: GU1-*	IP17	EXPRESS	IP17
Graphics board: GU1-*	IP22	EXPRESS	EXPRESS
Graphics board: LG1	IP12	LIGHT	LIGHT
Graphics board: LG1	IP17	LIGHT	IP17
Graphics board: LG1	IP20	LIGHT	LG1MC
Graphics board: VGR2	IP6, IP12	ECLIPSE	ECLIPSE
Graphics option installed	R2300, IP4	CLOVER1	IP4G
GT Graphics option installed	IP4, IP5, IP7	CLOVER2	<cpu> GT
GT Graphics option installed	IP9	CLOVER2	IP7GT
GT Graphics option installed	IP17	CLOVER2	IP17
VGX Graphics option installed	IP7, IP9	STAPUFT	IP7GT
VGX Graphics option installed	IP17	STAPUFT	IP17
VGXT Graphics option installed	IP7	STAPUFT	SKYWR
VGXT Graphics option installed	IP17	STAPUFT	IP17SKY
RealityEngine Graphics option installed	IP7	VENICE	IP7
RealityEngine Graphics option installed	IP17	VENICE	IP17
RealityEngine Graphics option installed	IP19	VENICE	IP19
No "Graphics" line	any	SERVER	SERVER

Table 9-1 *inst -m* GFXBOARD and SUBGR Values

2. Look for a line in the *hinv* output that includes the word "Graphics". Table 9-1 shows the GFXBOARD and SUBGR values for each of the "Graphics" lines you might see. To use the table, find one or more lines that match the "Graphics" line you see. From these lines, choose the one for your value of *<cpu>*. The final two columns contain the values of GFXBOARD and SUBGR you need. Some caveats are:
 - The table contains "Graphics" lines output by IRIX *hinv*. The Graphics lines output by *hinv* in the Command Monitor look slightly different.
 - You may see additional, unimportant information on the "Graphics" line which is denoted by * in the table.
 - The "Graphics" line output by *hinv* from the Command Monitor on RealityEngine™ workstations may not be correct. For RealityEngine workstations, use IRIX *hinv* or assume that you are seeing one of the RealityEngine lines listed.

For example, to install software on a disk mounted at */d* for an IP7 workstation with "GT Graphics option installed" using a local tape drive, the *inst* command is:

```
# /usr/sbin/inst -f tape -r /d -m CPUBOARD=IP7 \  
-m GFXBOARD=CLOVER2 -m SUBGR=IP7GT
```

Installation proceeds normally after *inst* is invoked except for three things:

- File systems are mounted at *<mountdir>* and *<mountdir>/usr*, rather than */root* and */root/usr*.
- *inst* does not use installation history information in */usr/lib/inst*; it looks for it in *<mountdir>/usr/lib/inst*. If *<mountdir>/usr/lib/inst* is empty (the likely case), you get the default installation selections initially. These selections are not based on what's presently installed on */* and */usr* on your workstation.
- The configuration files that are installed do not contain local modifications. You can customize them before or after moving the disk to the other system.

After exiting *inst*, give the following commands before moving the disk:

```
# /etc/chroot <mountdir> /etc/init.d/autoconfig -f  
# mv <mountdir>/unix.install <mountdir>/unix
```

Move the disk to the other workstation and try to boot IRIX. If IRIX doesn't boot, give the commands below in the Command Monitor. In particular, these commands are usually required if the disk was newly partitioned.

```
>> sash
sash: <drive>(0,<unit>)unix root=dks0d1s0 showconfig initstate=s
# mount -c /dev/dsk/dks0d1s6 /usr
# cd /dev
# ./MAKEDEV disklink
# /etc/chroot <mountdir> /etc/init.d/autoconfig -f
# mv <mountdir>/unix.install <mountdir>/unix
# reboot
```

The values of *<drive>* and *<unit>* for the various types of disks are shown in Table 8-3.

9.7 Installing Software for a Diskless Workstation

client
server

The Network File System catalog item includes software that enables workstations with or without a disk to use the disk space and software (including the IRIX kernel) resources of another workstation on the network. The workstation using the remote resources is called the *client*, and the workstation providing the resources is called the *server*.

share tree
client tree

In order to support this configuration, a *share tree* (a copy of the IRIX kernel and other software that can be shared by several clients) and a *client tree* (contains copies of files used exclusively by one client) must be installed on the server.

To install share and client trees on a server, you invoke the program *clinst*(1M) which sets up the environment and then invokes *inst*. When you use *inst* from *clinst*(1M), it is the same as using *inst* from the miniroot or IRIX, except that when you are installing client trees you never use the *from* command.

The complete procedure for installing share and client trees for use by diskless workstations (or workstations with disks) is described in the *Diskless Workstation Administration Guide*.

9.8 Installing Software for Hardware Upgrades

When you install a hardware upgrade on your workstation, it may or may not require a change in the software installed on your workstation. The documentation that comes with your upgrade should advise you on whether software installation is necessary for this upgrade. The possible cases are:

- No change is necessary to the software. Adding memory, bitplanes, and disks is in this category.
- The hardware upgrade comes with a software distribution in the form of a Software Product Release. Use the directions in Section 9.1 for installing this type of software distribution. If the software distribution contains Installation Tools, you must use them.
- The hardware upgrade comes with a software distribution in the form of a Maintenance Release. This is sometimes the case with newly introduced hardware. It contains hardware-specific files that have not yet been incorporated into Software Product Releases. In this case, the Maintenance Release can be installed just like any other Maintenance Release using the directions in Section 9.3, "Installing a Maintenance Release." If the software distribution contains Installation Tools, you must use them.
- The hardware option does not come with a software distribution, but it requires reinstalling all of the software already installed on your workstation. The discussion below covers this case.

Silicon Graphics software distributions usually contain software for all models and configurations of workstations. During installation, *inst* automatically selects the proper version of hardware-specific files. If your upgrade changes your CPU board or your graphics subsystem, you must reinstall all of the software presently on your workstation in order to get the right versions of files for your upgraded workstation.

When you have to reinstall all of your software after a hardware upgrade, be sure to follow the directions in Section 4.4, "Deciding the Installation Order of Software Distributions," to figure out in what order to install it. You must use Miniroot Installation.

Since you are reinstalling already installed software, *inst's* automatic subsystem selection algorithm puts a *k* next to each installed subsystem. If you just give the *go* command, nothing is installed, so you must explicitly

select the subsystems for installation and force *inst* to reinstall software that it thinks is already installed. An easy way to selected your already installed subsystems for reinstallation is to give the command:

```
Inst> install I
```

This command puts an **i** in the first column next to every subsystem in the distribution that has an **I** in the second column.

To tell *inst* to reinstall already-installed software, give this command before you give the *go* command:

```
Inst> set neweroverride
```

When you've completed your installation, but before you leave *inst*, you should give the *versions* command:

```
Inst> versions
```

and look at the installation dates in the third column. If any of them are not the current date, that subsystem was not reinstalled. It should be reinstalled or removed before you exit *inst*.

9.9 Reinstalling an Older Software Release

inst is designed for installing software products that are new to your workstation or newer than the version already installed. When you want to install an older version of *ee1* and *ee2* than the one currently installed on your workstation, the installation procedure must be modified. If you do not follow this modified procedure (for example, you use **set neweroverride on** instead), you may be left with configuration files that do not match the rest of the software. This could prevent you from rebooting your workstation and result in some difficulty diagnosing compatibility problems later.

The steps below describe the complete installation procedure when you are reinstalling an older release.

1. Before you begin the installation, you need to move certain configuration files and remove some others. This procedure saves your modifications to some configuration files, removes some configuration files in order to force versions without local modifications to be installed, and leaves certain critical configuration files unchanged. To perform these operations, give these commands from IRIX:

```
% /bin/su -
Password:
# /usr/sbin/versions -c -m | \
egrep -v "inittab|sys_id|hosts|passwd|group|fstab" \
> <configlist>
# sh
# cat <configlist> | \
while read f; do mv $f $f.bak; done
# exit
# /usr/sbin/versions -c | \
egrep -v "inittab|sys_id|hosts|passwd|group|fstab" | \
xargs rm
```

<configlist> is a file whose name you can choose. You will need this file later, so do not put it into a directory such as */tmp* where it gets removed when you reboot your workstation. Also, it must be in the */* or */usr* file systems.

2. Locate the software distribution tapes or software distribution directories that contain the older software that you want to install.
3. In Step 4, you will use the Installation Tools that you used most recently on your workstation, so you need to locate the software distribution

that contains them. For example, if 4D1-4.0 is installed on your workstation and you are returning to the 4D1-3.3.2 release, you must find the 4D1-4.0 software distribution (tape, CD, or distribution directory) that contains the Installation Tools.

4. Bring up *inst* using the procedure for your distribution source in Chapter 4. You must use the Miniroot Installation method and the Installation Tools that you prepared in Step 3.
5. You should see the Inst Main Menu. At the *Inst*> prompt, give the two commands shown below. They remove all of the currently installed software and exit *inst*. It is critical that you not give any other commands at the *Inst*> prompt at this time. (If you do give other commands, you have to reinstall the same version of software you want to get rid of, repeat Step 4, and then do Step 5 again.)



```
Inst> versions remove *
Removing selected <product>.<image> subsystems
...
Inst> quit
```

```
Please wait ...
Ready to restart the system. Restart? [y,n]
```

6. Your workstation begins the bootup process. If you see this message:
Starting up the system
To perform system maintenance instead, press <Esc>
then press <Esc> within 5 seconds (10 seconds on older workstations).

7. You see the System Maintenance Menu of five choices. Enter:

5

to get to the Command Monitor.

If you do not see this message (it depends on which version of the PROM Monitor you have) or if you miss the 5- or 10-second window, log in after your workstation reboots and shut it down to the PROM Monitor again.

8. Load the miniroot again, but this time use the Installation Tools from the software distributions that you found in Step 2.
9. You should see the first *inst* menu. The version of *inst* matches the software you want to install (examples below show 4D1-3.3.x). The first *inst* command you give must be the command to escape to the shell shown below. (If you give other commands, *inst* might core dump.)



10. After escaping to the shell, remove all of the files that make up what is known as your "installation history," because the installation history on your workstation may be incompatible with the version of *inst* that is running. Move */etc/inittab* now because this version isn't needed any more, and you want an unmodified version to be installed. The commands are:

```
Install> shroot

# rm /usr/lib/inst/{*,.options}
# mv /etc/inittab /etc/inittab.bak
# exit
# If you removed any system files in the shell
Issue a "recalculate" command to update space requirements

Install>
```

11. Follow the installation instructions for the software distributions from Step 2 and install the earlier software release. During this step you can give any commands you want at any *inst* prompt. *inst*'s initial selections are not consistent with what was installed previously, because *inst* no longer has information about which subsystems were installed on your workstation. It has made default selections.
12. After you've finished installing subsystems, but before you give the quit command, you must escape to the shell one more time. In the shell, you manually recreate all devices and special files. This procedure is necessary because device files from the later release that are still on your workstation can prevent it from booting properly. You can escape to the shell from any *inst* prompt.

```
Install> shroot

# mv /dev/MAKEDEV /
# rm -rf /dev
# mkdir /dev
# cd /dev
# mv /MAKEDEV .
# ./MAKEDEV
# exit
# If you removed any system files in the shell
Issue a "recalculate" command to update space requirements

Install>
```

13. Exit *inst* and reboot the workstation. You can do this from any prompt:

```
Install> quit
```

```
Ready to restart the system. Restart? [y, n] y
```

14. The workstation reboots and gives you a login window. Log in as *root* so that you can modify configuration files as needed:

```
login: root
```

```
Password:
```

15. Make modifications to your configuration files:

- Move */usr/lib/sendmail.cf.bak* to */usr/lib/sendmail.cf*.
- If you created a backup tape of modified configuration files as described in Section 4.5, "Backing Up Your Workstation," when you were running this release earlier, you should be able to restore the files in the list in *<configlist>* from the tape and use them as is.
- If you don't have a backup tape, you should compare the *.bak* and installed versions of the files in *<configlist>* and make any changes necessary using a process similar to the one for merging configuration files described in Section 6.2. Be careful not to introduce new features from the later release.
- Merge */etc/inittab.bak* with */etc/inittab* as described in the previous bullet.
- */etc/sys_id*, */etc/hosts*, */etc/passwd*, */etc/group*, and */etc/fstab* probably don't require any modification since they are your most recent version and are unlikely to have compatibility problems.

16. If you modified any configuration files, you should restart your workstation now in order to restart any daemons that may have been affected by the configuration file changes.

inst Commands Reference

This chapter contains reference information about the commands that you can give while using inst.



***inst* Commands Reference**

This chapter provides reference information on the commands that you can give while using the *inst* menus. It is divided into these sections:

- 10.1, “Commands,” lists the commands in alphabetical order with a description of each command.
- 10.2, “from Arguments,” gives the syntax for the argument to the *from* command. This syntax is used for the *inst -f* option as well.
- 10.3, “set Options,” describes the options of the *set* command in alphabetical order. A table lists the possible values, the default values, and whether or not value is saved from one *inst* session to the next.
- 10.4, “Keywords,” provides a table that describes the keyword arguments that can be given to the *list*, *install*, *remove*, *keep*, and *step* commands.
- 10.5, “list Output,” describes the output of the *list* command and gives an example.
- 10.6, “versions Output,” describes the different forms of output you can get from the *versions* command, with examples of each.
- 10.7, “files Output,” describes the output of the *files* command and has an example.
- 10.8, “Syntax Summary,” provides a grammar of all of the *inst* menu commands.

10.1 Commands

All of the commands on all of the menus are listed in this section. They are case insensitive, so you can use uppercase letters in command names if desired. To get additional information about the arguments that these commands take, see Section 10.8, "Syntax Summary."

`admin` The `admin` command switches you to the Administrative Commands Menu. It provides a variety of functions that are not needed for most installations.

The `from` and `help` commands are available from the Administrative Commands Menu but are listed only if the `set` option `fullmenu` is on.

`continue` Once an error has occurred and the Interrupt/Error Menu has been displayed, the `continue` command causes `inst` to attempt to continue with the installation or removal from the point at which the interrupt occurred. See Section 8.4.2, "Messages Followed by the Interrupt/Error Menu," for hints on recovering from interrupts.

The `continue` command does not retry the failed operation; work on that file or auxiliary command ended when the error occurred and `inst` attempts to continue with the next file.

`date` The `date` command with no arguments displays the system date. It can be given `date(1)` arguments to change the date.

`files` The `files` command is used to list the names and other information about the files that make up a subsystem or group of subsystems. The other information includes any pending selection for the file (i.e. `install`, `remove`, or `keep`), the installation state, the subsystem name, disk space delta, and file type.

`from` Use the `from` command to specify the location of the software distribution you wish to install (the software distribution source, `<source>`) and possibly a single product in the software distribution source that you plan to install. The syntax of the argument to the `from` command is defined in Section 10.2, "from Arguments."

Giving a `from` command causes these four things to happen:

- A connection with the distribution source is established.

- The product descriptions are read from the source. *inst* displays the list of product descriptions it reads.
- The current selections for installation and removal are forgotten. If the set option *autoselect* is on, *inst* uses its algorithms for making initial installation selections. If *autoselect* is off, nothing is selected for installation.
- If the set option called *delayspacecheck* is off then the next time you give the *list* or *step* command, a disk space calculation will be done prior to displaying the output you requested from *list* or *step*.

If the distribution source is a remote workstation, *inst* must have access to the IP address of the remote workstation (<server>). If it cannot find the address in your workstation's */etc/hosts* file (*/etc/hosts* or */root/etc/hosts*), it will prompt you for the address.

When *inst* first comes up, it prints a message about the default location of the software distribution. If this location (software distribution source) is correct, then you need not give the *from* command.

go Once the *install*, *remove*, and *keep* selections are complete, the *go* command is used to start the actual installation and removal of files. Before the installation begins, several checks are done to make sure that the selections are valid. If any of these checks fail, none of the installation and/or removal operations is done and an error message is displayed.

help *inst* has extensive on-line help. To get help, use the command

```
Inst> help <topic>
```

where <topic> is a word of your choice. Almost any word you see on a menu, single letters you see in the output of *list* and *step*, and many *inst* "jargon" words have on-line help. The complete list of <topic> arguments is shown in Table 10-1.

If you are unfamiliar with *inst* or totally confused, start with **help beginner**.

If help output is more than one screenful, a *more?* prompt appears after one screenful. Press the <space bar> when you are ready to see more output.

Topic	Topic	Topic	Topic	Topic
*	devices	installed	neweroverride	shroot
+	dir	instmode	nfs	sizes
.N	dist	interrupt	older	source
.O	empty	k	options	space
?	error	keep	overprint	step
@	files	kernelerror	prerequisite	stop
I	from	keyword	product	subsystem
N	fsname	keywords	products	subsystems
X	fullmenu	lines	quit	syncerror
addr	go	list	r	tapeerror
admin	help	lverror	readerror	timeout
all	hname	main	recalculate	timeouterror
args	host	menus	removable	umount
beep	i	miniroot	remove	uninstalled
beginner	image	mkfs	required	unmount
clean	images	mode	return	verbose
clearprompt	incompat	more	server	verboselist
columns	incompatible	mount	set	verboserm
continue	inst	names	sh	versions
date	install	networkerror	share	wrapmode
default	installable	newer	shell	

Table 10-1 help Topics



install The `install` command is used to select subsystems for installation. This only queues your request; the installation not occurs only after you use the `go` command. Until then, you can change your selections as you wish, using the `install`, `remove`, `keep`, and `step` commands.

keep The `keep` command is used to select subsystems that should be kept as is on the disk. It cancels any `install` or `remove` requests that you have made for the subsystem arguments. The existing versions on the disk, if any, remain undisturbed.

list The `list` command shows the subsystems that are in the currently available distribution. See Section 10.5, “list Output,” for a complete description of the output.



mkfs The `mkfs` command can be used in Miniroot Installations only. It replaces the `clean` command found in earlier versions of *inst*.

If a brand new disk is being used or if the current contents of the disk or a file system are to be completely removed (cleaned), you can make new, empty file systems with this command. By default, new file systems are made on the root (/) and user (/usr) file systems. Alternately, you can specify the disk device to operate on by name. Two examples are **mkfs /usr** and **mkfs /dev/dsk/dks0d1s6**.



All existing files, including all directories, programs, configuration files, and data, are lost when a new file system is made. You will be warned if a file system is already on the named device, and prompted for a confirmation before any new file system is made.

mount To find out what is mounted, to change the default mounts, or to add new mount points that are unknown to *inst*, use the **mount** command. Without arguments, it displays what is currently mounted. The two arguments are the block device name and the mount point. You can specify the mount point in absolute terms, although it will be mounted relative to */root* for the duration of the installation. The **mount** command with arguments can be used only during Miniroot Installations.

quit Use **quit** to exit *inst*.

If you have made installation and/or removal selections but have not given the **go** command, you will be asked to confirm whether or not you really want to quit. If you type **yes**, the selections are discarded. If you type **no**, you are returned to your current menu. You can use the **list** command to find out what the selections are and the **go** command to initiate them.

Auxiliary commands might be executed automatically after you use **quit**. If you are using the miniroot, you will be asked if you are ready to restart. If you answer **no**, *inst* starts up again. If you answer **yes**, your system is rebooted and comes up running the new software.

recalculate

The **recalculate** command initiates a disk space calculation. It identifies the current amount of free disk space and calculates the impact of installing all of the subsystems in the software distribution.

This command is needed only when you escape to a shell and use the *rm(1)* command. In this case, *inst* needs to recalculate its idea of the free disk space in order to give you accurate disk space usage information.



remove Use the **remove** command to select installed subsystems that should be removed from the system. The removal does not occur until you enter the **go** command. Until then, you may change your selections for any or all subsystems. To undo a **remove** request, use the **keep** command.

inst automatically removes old versions of subsystems you have selected for installation, so it is not necessary to remove them explicitly. Typically, you remove software when you no longer need it or when your disk is so full that you must remove something in order to install something you need more.

return The **return** command switches you from the Administrative Commands Menu to the Inst Main Menu. If you want to execute a command from the Inst Main Menu while you are in the Administrative Commands Menu, give the command **return** *<command>*. It executes *<command>* as if your current menu is the Inst Main Menu but leaves you at the Administrative Commands Menu.

set The **set** command is used to examine and change the settings of variables called options. If you provide no arguments, the current settings are displayed. If you provide the name and a value, the option value is changed.

Most option settings are saved in the installation history when you issue the **quit** command, and are restored the next time you invoke *inst*. Section 10.3, "set Options," describes all **set** options in detail.

sh With no arguments, the **sh** command invokes an IRIX shell. If you provide arguments, they are taken as a single IRIX command to be executed immediately.

shroot With no arguments, the **shroot** command invokes a "chrooted" IRIX shell (see *chroot(1M)*). If you provide arguments, they are taken as a single IRIX command to be executed immediately.

The `shroot` command uses the `chroot(2)` system call to invoke the shell as if `/root` were its root directory; that is, `/root` becomes `/` for all references. Thus files can be referred to with their normal pathnames.

space The `space` command gives the same disk space summary as the `list` command if the `set` option `delayspacecheck` is off. If `delayspacecheck` is on, then giving the `space` command forces the disk space calculation to be performed and a disk space summary appears.

step The `step` command puts you into a special mode that enables you to interactively select subsystems for installation or removal. The `step` command takes keyword arguments and product, image, and subsystem name arguments.

In `step` mode, `inst` enters a special mode whereby it reads single keystrokes. Each subsystem is displayed in turn; the key you press determines what happens. The actions and the keys you press are shown in Table 10-2.

Key	Action
<code>+</code>	Retain current request
<code>-</code>	Retain current request, print previous subsystem next
<code>/<pattern><Enter></code>	Search for pattern <code><pattern></code>
<code>d</code>	Select for installation if marked with <code>*</code> or already installed
<code>f</code>	List the files in this subsystem
<code>i</code>	Select for installation
<code>k</code>	Keep current version and/or cancel current request
<code>l</code>	List all previous subsystems
<code>n</code>	Retain current request
<code>p</code>	Retain current request, print previous subsystem next
<code>q</code>	Quit step mode
<code>r</code>	Select for removal
<code>D</code>	Select all subsystems in product for installation if marked with <code>*</code> or already installed
<code>I</code>	Select all subsystems in product for installation

Table 10-2 Keys Used in `step` Mode

Key	Action
K	Keep current version and/or cancel current request for all subsystems in product
N	Retain current request for all subsystems in product
P	Retain current request, print first subsystem of previous product next
R	Select all subsystems in product for removal
<Enter>	Retain current request
<right-arrow>	Select for installation
<left-arrow>	Keep current version and/or cancel current request
<down-arrow>	Retain current request
<up-arrow>	Retain current request, print previous subsystem next
<shift-right-arrow>	Select all subsystems marked with * for installation
<shift-left-arrow>	Keep current version and/or cancel current request for all subsystems
<shift-down-arrow>	Retain current request for all subsystems
<shift-up-arrow>	Retain current request, print first subsystem of previous product next

Table 10-2 (continued) Keys Used in step Mode

stop	When an error has occurred and the Interrupt/Error Menu is displayed, the <code>stop</code> command terminates the current installation or removal. It returns you to the Inst Main Menu. At this point you can make corrections and/or retry the command that was in progress when the problem occurred.
umount	The <code>umount</code> command is used to unmount disks that <i>inst</i> has mounted by default or that have been mounted with the <code>mount</code> command. The file system's name remains in <i>inst</i> 's device table even after the file system is unmounted. In some cases, file systems mounted under the specified file system have to be unmounted first.

versions The **versions** command is the same as the IRIX *versions(1M)* command. Examples of using **versions** while in *inst* are:

- Display the currently installed subsystems:

```
Inst> versions
```

- Display all of the subsystems that have ever been available for installation (obsolete maintenance subsystems are not listed):

```
Inst> versions -a
```

- Select *<names>* for removal and perform the removal of these and any other subsystems selected for removal:

```
Inst> versions remove <names>
```



When you use **versions remove**, the removal of *<names>* and all other subsystems marked for removal is done immediately, rather than when the next **go** command is given.

See the *versions(1M)* manual page for the complete syntax of the command. Section 10.6, “versions Output,” describes the output of the **versions** command in detail.

10.2 from Arguments

This section describes the syntax of the argument to the **from** command. The information in this section also applies to two other situations:

- If you invoke *inst* from IRIX (see Section 7.5, “Specifying the Distribution Source on the Command Line”), you can use the **-f** option to specify the software distribution source you want to use. The **-f** option takes an argument whose syntax is identical to some of the possible arguments to the **from** command.
- If you don’t give an argument to the **from** command, you are prompted for information. The information below can help you respond using the correct syntax.

The **from** command is used to specify the software distribution source you want to use and might include a user ID and the name of a product you plan to install as well. Table 10-3 gives the possible forms of the **from** command.

Command	Purpose
from	Specify a software distribution source in response to prompts.
from <source>	Specify a software distribution source.
from <source>/<product>	Specify a software distribution source and a product within that software distribution. (This form cannot be used when <source> is a tape device.)
from \$dist	Specify the most recently used software distribution source.
from \$dist/<product>	Specify the most recently used software distribution source and a product within that software distribution. (This form cannot be used when <source> is a tape device.)

Table 10-3 Forms of the `from` Command

<product> is the name of a product in the software distribution (see Section 2.1, "Anatomy of a Catalog Item"). Including the name of a product means that only that product will be available for installation, but has the advantage that it reduces the time required for disk space checking and verification of your installation history.

You can use `$dist` in the `from` command as a shorthand for the current distribution source. It stands for the current value of the `set` option called `dist`. `dist` is automatically set each time product descriptions are read from a distribution source. When you first invoke `inst`, the value of `dist` is the last software distribution source you used the last time you used `inst`. You can check the value of `dist` at any time by giving the `set` command with no argument.

The syntax for <source> depends on whether the distribution source is local or remote, and for remote distribution sources, whether the default user ID, `guest`, is being used on the remote workstation or another user ID is being used. Table 10-4 shows the syntax for <source>.

<i><source></i>	Local/Remote Distribution Source	User ID
<i><path></i>	Local	<i>root</i>
<i><server>: <path></i>	Remote	<i>guest</i>
<i><user>@<server>: <path></i>	Remote	<i><user></i>

Table 10-4 *<source>* Syntax

<server> is the name of the remote workstation that has the distribution source or its IP address.

<user> is a user ID on the remote workstation that will be used during installation. See Section 3.3, "Configuring an Installation User ID," for more information.

<path> is the pathname of the software distribution. Table 10-5 shows the syntax for *<path>* for different distribution sources.

<i><path></i>	Distribution Source
tape	Local or remote tape where the tape drive is linked to <i>/dev/nrtape</i> (this is the usual case)
<i><nrtapedevice></i>	Local or remote tape (usually used when two or more tape drives and/or CD-ROM drives are present)
/CDROM/dist	Local CD-ROM
<i><CDdir>/dist</i>	Remote CD-ROM
<i><distdir></i>	Local or remote distribution directory

Table 10-5 *<path>* Syntax

<CDdir> is the mount point directory used for the CD. See Section 4.6, "Preparing for Installing from a Remote Distribution Source."

<distdir> is the pathname of the distribution directory. See 7.25, "Creating Software Distribution Directories," for more information.

`<nrtapedevice>` is the device name of the no-rewind, byte-swapped version of the tape drive. Specifying a tape drive using this form of `<path>` rather than the simpler form of "tape" is typically required only when two or more tape drives are present on a workstation. The procedures for figuring out the value of `<nrtapedevice>`, or alternatively, changing `/dev/nrtape` so that you can use **tape** instead of `<nrtapedevice>` are given in Section 7.4, "Choosing Tape Device Names."

The following examples of the `from` command show some of the possible arguments:

- Use the local tape drive, `/dev/nrtape`:
Inst> **from tape**
- Use a particular tape drive when the workstation has more than one tape drive:
Inst> **from /dev/mt/tps0d3nr**
- Use the tape drive on a remote workstation whose name must be fully qualified:
Inst> **from bigserver.eng.sgi.com:tape**
- Use the single product `nfs` from a remote CD on the workstation called "bigserver":
Inst> **from bigserver:/CDROM/dist/nfs**
- Use a remote distribution directory as user `instuser`:
Inst> **from instuser@bigserver:/d/distdir**
- Reuse last distribution source (sometimes used to force `inst` to re-read production descriptions and recalculate disk space requirements):
Inst> **from \$dist**
- When `$dist` is a remote distribution directory, use only the `nfs` product from it:
Inst> **from \$dist/nfs**

For information on the results of giving a `from` command, see the discussion of `from` in Section 10.1.

10.3 set Options

The set options with their possible values and default values are listed in Table 10-6. The fourth column in the table, "Saved?," indicates whether the last value of the option is saved when *inst* exits and becomes the value of the option the next time *inst* is invoked. The remainder of this section describes the function of each of the set options.

Option	Values	Default Value	Saved?
autoselect	on, off	on	yes
beep	on, off	off	yes
clearprompt	on, off	on	yes
columns	integer	80 or current	no
delayspacecheck	on, off	off	yes
detailspacecheck	on, off	on	yes
dist	<source>	local tapedevice or <source>	yes
fullmenu	on, off	off	yes
instmode	normal, prototype, client	set automatically	no
lines	integer	24, 40 or current	no
menus	on, off	on	yes
neweroverride	on, off	off	no
overprint	on, off	on	yes
share	on, off	off	no
shell	/bin/sh, /bin/csh, other shell	SHELL environment variable or /bin/csh	yes
timeout	integer	180	yes
verbose	on, off	off	yes
verboselist	on, off	off	yes
verboserm	on, off	off	yes
wrapmode	wrap, truncate	wrap	yes

Table 10-6 set Option Values

`set autoselect`
Controls whether *inst* does an initial selection of subsystems to be installed when it is first started and after every `from` command. If `autoselect` is on, *inst* makes initial selections. If it is off, no initial selections are made.

`set beep`
Controls the audible signaling of the completion of a `go` command.

`set clearprompt`
Controls the way in which some prompts are displayed. Certain operations use “throw away” prompts that are usually cleared by backspacing, then overwriting with spaces. For terminals that can’t clear prompts in this way, it is more appropriate just to move to the next line.

`set columns`
Defines the width of the screen for the `more?`, wrapping, and truncating mechanisms. It is set to the current window width, or to 80 if no relevant value can be found.

`set delayspacecheck`
Controls the timing of disk space calculations. If `delayspacecheck` is off, disk space calculation is done when a `list`, `step`, or `space` command is given if no disk space calculation has yet been done for the current software distribution. If `delayspacecheck` is on, disk space calculation is deferred until the `go` or `space` commands are given. When `delayspacecheck` is on, no disk space information is displayed by the `list` or `step` commands.

`set detailpacecheck`
Controls the speed and accuracy of disk space calculations. If `detailpacecheck` is on, disk space calculations are more accurate, but take longer. If `delayspacecheck` is off, disk space calculation is faster, but less accurate.

`set dist`
Your most recent distribution source (`<source>`) is remembered. You can reference it in commands with the `$dist` variable; for example `from $dist/ee2`.

- set fullmenu
Controls the list of commands shown in menus. If `fullmenu` is `off` (the default) the most commonly used commands are displayed in the menus. If `fullmenu` is `on`, all commands that are available at the prompt are shown in the menu; that is, all the hidden commands are displayed, too. This option changes only the display of commands, not their availability.
- set instmode
Controls certain details of how the installation is performed. The value is set automatically when the distribution is first accessed.
- set lines
Defines the height of the screen for the `more?` mechanism. It is set by default to the current window size, or 24 if no relevant value can be found. You can set it to 0 to disable the `more?` mechanism which makes unattended installations of multiple products easier.
- set menus
Controls the automatic display of menus. Once you are familiar with the menus, you may wish to disable the automatic display by setting this option to `off`. You can redisplay the current menu at any time with a `?` command.
- set neweroverride
Normally, *inst* will not install an older subsystem over a newer one. If `neweroverride` is `on`, the installation of versions of subsystems that are older than the versions currently installed is allowed. This is not recommended, however, because configuration files are not automatically reverted to a version compatible with the older release.
- set overprint
Controls the manner in which pathnames are displayed during verbose installations and removals. When this option is `on`, the file names are overprinted on the same line whenever possible. This mode requires that the terminal respond to a carriage return control character by resetting the cursor to the left margin without advancing to the next line. If you prefer scrolling as the file names are displayed, set this option to `off`.

- `set share`
Controls the way files are created in a diskless client. Normally, most files are created as symbolic links to the */share* tree; setting this option `off` creates actual copies of the files instead and consumes a much greater portion of the disk on the server. This option is set `on` automatically when installing a diskless client, and `off` otherwise.
- `set shell`
Gives the name of the IRIX command that is invoked for `sh` and `shroot` commands. It is normally */bin/sh* or */bin/csh*. The default value comes from the SHELL environment variable if it is set; otherwise */bin/csh* is used.
- `set timeout`
Controls the network timeout delay. The default is 180 seconds; if your network is particularly slow, this may not be enough. If you get error messages about network timeout, you can use `stop` to get back to the Inst Main Menu, increase the value of `set`, and try again.
- `set verbose`
Controls the printing of file names and certain other information during installations.
- `set verboselist`
Controls the display of products and images in `list` output. Normally, only subsystems are listed; if this option is `on`, lines describing products and images are displayed as well. Alternatively, you can leave this option `off` and use **`list products`** or **`list images`** to obtain information about products and images.
- `set verboserm`
Controls the printing of file names during removal of subsystems.
- `set wrapmode`
Controls the display of long subsystem descriptions by the `list` command. In wrap mode, the part of the description that overflows the right margin of the screen is shown indented on the next line. In truncate mode, the line is truncated near the right margin. The `step` command always uses truncate mode, regardless of the setting of this option.

10.4 Keywords

keywords

The `list`, `install`, `remove`, `keep`, and `step` commands take arguments called *keywords*. Most keywords are abbreviations (a shorthand) for groups of subsystems. Two keywords are shorthands for all products (`products`) and all images (`images`). One keyword, `sizes`, is a request for the absolute sizes of products, images, and subsystems. Many of the keywords have a long form and a single character form. Table 10-7 lists each keyword, its single character equivalent, if it has one, and a description of the products, images, or subsystems for which that keyword stands.

Keyword	Single Character	Meaning
<code>all</code>	<code>a</code>	All subsystems in versions <code>-a</code> output plus all subsystems in the software distribution.
<code>default</code>	<code>d</code>	All subsystems in the distribution that are marked with <code>*</code> . Installation of these subsystems is suggested.
<code>images</code>		All images in the distribution. Can be used with <code>list</code> only.
<code>install</code>	<code>i</code>	All subsystems that are selected for installation (i.e. all subsystems with <code>i</code> in first column of <code>list</code> output).
<code>installable</code>	<code>A</code>	All subsystems in the software distribution. When no keyword argument is given to the <code>list</code> and <code>step</code> , the <code>installable</code> keyword is used by default.
<code>installed</code>	<code>I</code>	All subsystems that have the same version installed and available for installation. An <code>I</code> appears in the second column of <code>list</code> output.
<code>keep</code>	<code>k</code>	All installed subsystems that are in the software distribution, but not selected for installation or removal. A <code>k</code> appears in the first column of <code>list</code> output.
<code>newer</code>	<code>N</code>	All subsystems that have a version installed that is newer than the version in the software distribution. An <code>N</code> appears in the second column of <code>list</code> output.
<code>older</code>	<code>X</code>	All subsystems that have a version installed that is older than the version in the software distribution. An <code>X</code> appears in the second column of <code>list</code> output.
<code>products</code>		All products in the distribution. Can be used with <code>list</code> only.

Table 10-7 Keywords

Keyword	Single Character	Meaning
removable	L	All of the installed subsystems that can be selected for removal.
remove	r	All of the subsystems that are selected for removal. They have an r in the first column of <code>list</code> output.
required	q	All of the subsystems that are required for proper operation of the workstation. A '+' appears after the names of these subsystems.
sizes		Display absolute sizes of products, images, and subsystems in the file system blocks columns rather than net change after installation or removal. Can be used with <code>list</code> and <code>step</code> only.
uninstalled	U	Subsystems that meet all of these conditions: they were available for installation in the past, they are not currently installed, they don't have a version in the distribution, and they are not <i>maint</i> subsystems.

Table 10-7 (continued) Keywords

10.5 `list` Output

This section describes the contents of the output of the `list` command. Figure 10-1 gives an example of `list` output. The command given in the example was `list nfs`.

The output of the `list` command can be broken into five sections. The first section, the first six lines of text, contains keys to the single letter codes used in the third section. The second section, the next two text lines, gives header information. The first line describes the contents of the list by giving the keyword used to specify the list, and the second line gives headings for the columns in the next section. The names of every mounted file system are included in the headings.

i = installation requested I = installed
r = removal requested X = older version installed
k = no action/keep existing version N = newer version installed

* = default subsystem at initial installation
@ = subsystem must be installed from the miniroot
+ = subsystem required for basic system functionality

Subsystems available for installation (list installable):

Subsystem	/	/usr	Description
nfs.man.nfs	0	337+	NFS Support Manual Pages
nfs.man.relnotes *	0	15+	NFS Release Notes
nfs.sw.dskless *	161+	78+	Diskless Support
i X nfs.sw.nfs *	9+	73-	NFS Support
i X nfs.sw.nis *	0	430+	NIS (formerly Yellow Pages) Support

Disk space summary (512-byte blocks):

Effect of install selections	9+	357+
Effect of remove selections	0+	0+
Installation overhead	17+	1016+
Net change in blocks	26+	1373+
Blocks available	16174+	8731+

Inst>

Figure 10-1 Sample list Output

The third section of the output contains subsystems and possibly products and images (controlled by the `verboselist` option of `set`). Included in this section are several columns of information about each subsystem. The first column is one of the following characters, which indicates the current selection for the subsystem:

i Install this subsystem.
r Remove the installed version of this subsystem.
k Keep this subsystem the way it is on disk. Do not install this
 subsystem, and do not remove currently installed version.
(blank) Do not install this (currently uninstalled) subsystem.

The second column indicates how the subsystem in the software distribution relates to the subsystem on the disk:

- I The versions in the distribution and on disk are the same.
- X The installed version is older than the version in the distribution.
- N The installed version is newer than the version in the distribution.
- (blank) This subsystem is not installed.

The next column shows the name of the subsystem. Subsystem names sometimes change, and sometimes the contents move to different subsystems from release to release. *inst* takes this possibility into account, with the result that sometimes you might see a subsystem marked X (older version installed), yet the *versions* command does not show a subsystem by that name. In this case a name change has occurred or the contents of the earlier subsystem have been combined with another subsystem.

Subsystem names may be followed by single letter codes that give installation characteristics of that subsystem:

- * Default subsystem at initial installation
- @ Subsystem must be installed from the miniroot
- + Subsystem required for basic system functionality

The characteristics of default, *, subsystems are described in Section 2.3, "Required and Default Subsystems." If a subsystem is marked with @, it requires Miniroot Installation. Subsystems that are required for basic functionality (marked +), must be installed by the time that the *quit* command is given or you cannot leave *inst*.

Following the subsystem name and codes may be one or more columns of disk space deltas. The numbers represent the projected change in disk space (measured in 512-byte blocks) that would result from installing the subsystem if it is marked i, k, or blank, or removing the subsystem if it is marked r. Since more than one file system can be involved (normally / and /usr), disk space accounting is given for each file system involved.

The disk space change numbers may be negative, indicating that the operation will result in a decrease in disk use. This occurs when the software being removed takes up more space than the software available for installation. It can also occur when a file has moved from one subsystem to another.

If the set option `delayspacecheck` is on, the disk space usage columns will not appear.

The last column gives a brief description of the subsystem.

The final section in the `list` output is the disk space summary at the bottom. It shows the following for each mounted file system:

Effect of install selections

The total change in disk space that would result from performing all of the installation requests

Effect of remove selections

The total change in disk space that would result from performing all of the removal requests

Installation overhead

A generous estimate of additional space that may be used during the `go` portion of the installation

Net change in blocks

The total of the previous three values: the total projected disk space change for the requested operations

Blocks available

The free space available on the file system

If the Net change in blocks amount is larger than the Blocks available amount, the installation cannot proceed because of the extreme likelihood of running out of disk space. If this condition exists when you issue the `go` command, a message is displayed and you are returned to the `inst` prompt immediately.

10.6 versions Output

The `versions` command displays information about installed software. The output of the `versions` command depends on arguments you give. It contains either information about products, images, and subsystems, or it contains information about files. This section shows sample output for both types of output and explains the fields. Since the *inst* `versions` command and the IRIX `versions` command are exactly the same, you can refer to the *versions(1M)* manual page for complete information on all of the arguments.

Figure 10-2 shows sample output from the command `versions eoe1 eoe2`. This command displays information about products, images, and subsystems.

This output is in two sections. The header information explains the key to the letters (if any) in the first column and labels the columns. The second section contains one line for every product, image, or subsystem that matches the arguments to the `versions` command.

- The first column contains the installation status of the product, image, or subsystem listed on that line. The possible status letters and their meanings are:
 - I** For subsystems, **I** means that this subsystem is installed. For product and images, **I** means that part or all of the product or image is installed. Note that this **I** does not have the same meaning as the **I** in `list` output. This **I** means only that some version is installed.
 - R** **R** means that this product, image, or subsystem was installed at one time but has since been removed.
 - (blank) This product, image, or subsystem was included in a software distribution that was available for installation at some time in the past, but it has never been installed.

By default, only installed products, images, and subsystems are shown unless you give the `-a` argument to `versions`, so the default installation status is always **I** (installed).

- The second column gives the name of the product, image, or subsystem.

- The third column gives the date of installation. If the `-n` argument is given to `versions`, this column contains a version number instead. The last three digits of the version number for a subsystem are known as its "alpha number."
- The fourth column contains a description of the product, image, or subsystem.

I = Installed, R = Removed

	Name	Date	Description
I	eeo1	06/16/91	Execution Only Environment 1 4D1-4.0
I	eeo1.man	06/16/91	eeo1 Documentation
I	eeo1.man.relnotes	06/16/91	Workstation Release Notes
I	eeo1.man.unix	06/16/91	Basic UNIX documentation
I	eeo1.sw	06/16/91	eeo1 Software
I	eeo1.sw.lib	06/16/91	Execution Library
I	eeo1.sw.unix	06/16/91	Basic UNIX
I	eeo2	06/16/91	Execution Only Environment 2 4D1-4.0
I	eeo2.man	06/16/91	eeo2 Documentation
I	eeo2.man.4Dwm	06/16/91	4Dwm Default Window Manager
I	eeo2.man.X11	06/16/91	X11 Execution Environment Manual Page
I	eeo2.man.Xapps	06/16/91	Xapps Manual Pages
I	eeo2.man.cdrom	06/16/91	CD-ROM Manual Pages
I	eeo2.man.demos	06/16/91	Graphics Demonstration Programs
I	eeo2.man.gltools	06/16/91	Graphics Library Tools Manual Pages
I	eeo2.sw	06/16/91	eeo2 Software
I	eeo2.sw.4Dwm	06/16/91	4Dwm Default Window Manager
I	eeo2.sw.X11	06/16/91	X11 Execution Environment
I	eeo2.sw.Xapps	06/16/91	X11 Applications
I	eeo2.sw.Xdemos	06/16/91	X11 Demos and Images
I	eeo2.sw.demos	06/16/91	Graphics Demonstration Programs
I	eeo2.sw.envm	06/16/91	Visual File System Interface
I	eeo2.sw.fonts	06/16/91	Standard Fonts
I	eeo2.sw.gltools	06/16/91	Graphics Library Tools
I	eeo2.sw.lp	06/16/91	Line Printer Spooling Utilities
I	eeo2.sw.sysadm	06/16/91	System Administration Utilities
I	eeo2.sw.tcp	06/16/91	TCP/IP Networking Support
I	eeo2.sw.vadmin	06/16/91	Visual System Administration Interfac

Figure 10-2 Sample versions Output for Products, Images, and Subsystems

Figure 10-3 shows an example of versions output with file information. Most versions commands that display file information show just file names and possibly a single character code. Figure 10-3 is an example of this short form that was output by the command **versions config nfs**.

```
Configuration Files

m      = modified since initial installation
?      = modification unknown
blank  = file is as originally installed

m /etc/bootparams
  /etc/bootparams.N      (.N = new version containing suggested changes)
  /etc/config/automount
  /etc/config/automount.options
  /etc/config/lockd
  /etc/config/nfs
m /etc/config/yp
  /etc/config/ypmaster
  /etc/config/ypserv
  /etc/ethers
m /etc/exports
  /etc/netgroup
  /etc/netid
  /usr/etc/yp/make.script
  /usr/etc/yp/ypmake
  /usr/etc/yp/ypxfr_1pd
  /usr/etc/yp/ypxfr_1ph
  /usr/etc/yp/ypxfr_2pd
  /usr/sysgen/system.dl
? /usr/sysgen/system.dl.O      (.O = old version, saved for comparison)
```

Figure 10-3 Sample versions Output for Files (Short Form)

The single character codes that appear in this type of output are:

(blank) This file has not been modified since original installation.

m This file has been modified since its installation.

? This file may or may not have been modified.

When the long argument is given to versions commands that display files, more information about each file is displayed. Figure 10-4 shows an example of this that was generated with the command **versions -c long nfs**. It shows the configuration files in the *nfs* product in a long form.

```

f 32795      1 nfs.sw.nfs      c etc/bootparams
f 49244      1 nfs.sw.nfs      c etc/config/nfs
f 24676      1 nfs.sw.nis      c etc/config/ypmaster
f 24676      1 nfs.sw.nis      c etc/config/ypserv
f 42361      1 nfs.sw.nis      c etc/ethers
f 37211      1 nfs.sw.nis      c etc/exports
f 32795      1 nfs.sw.nis      c etc/netid
f 27802     19 nfs.sw.nis      c usr/etc/yp/make.script
f 32873      4 nfs.sw.nis      c usr/etc/yp/ypmake
f 30800      2 nfs.sw.nis      c usr/etc/yp/ypxfr_1pd
f 40458      2 nfs.sw.nis      c usr/etc/yp/ypxfr_1ph
f 24035      2 nfs.sw.nis      c usr/etc/yp/ypxfr_2pd

```

Figure 10-4 Sample versions Output for Files (Long Form)

- The first column contains one of the following codes for the file type:
 - f** Plain file
 - d** Directory
 - b** Block special
 - c** Character special
 - l** Symbolic link
 - p** Fifo (named pipe)
- The second column contains the checksum of the file at the time the file was installed. You can get this checksum with the *sum(1)* command **sum -r**.
- The third column contains the size of the file in blocks at the time it was installed.
- The fourth column contains the name of the subsystem that includes this file.
- The fifth column contains another file type code for some files:
 - c** Configuration file.
 - t** Orphaned configuration file. This file was installed with a subsystem that has since been removed.
 - m** Machine-specific file. A hardware-specific version of this file is installed.

10.7 files Output

The `files` command displays a list of the files in subsystems. An example of the output of the `files` command from the command `files eoe1.sw.quotas` is shown in Figure 10-5.

```
i   eoe1.sw.quotas          1+ f etc/config/quotacheck
i   eoe1.sw.quotas          1+ f etc/config/quotas
i   eoe1.sw.quotas          f  etc/init.d/quotas
i   eoe1.sw.quotas          1+ l etc/rc2.d/S10quotas
i   eoe1.sw.quotas          193+ f usr/bsd/quota
i   eoe1.sw.quotas          145+ f usr/etc/edquota
i   eoe1.sw.quotas          137+ f usr/etc/quot
i   eoe1.sw.quotas          145+ f usr/etc/quotacheck
i   eoe1.sw.quotas          1+ l usr/etc/quotaoff
i   eoe1.sw.quotas          25+ f usr/etc/quotaon
i   eoe1.sw.quotas          129+ f usr/etc/repquota
i   eoe1.sw.quotas          28+ f usr/sysgen/boot/quotas.o
```

Figure 10-5 Sample files Output

- The first, second, and third columns are identical to the first three columns of `list` output. (The second column is empty in Figure 10-5.) The installation status in the second column applies to the subsystem as a whole and says nothing about whether or not that particular file is currently installed.
- The fourth column shows the net change in disk space used if the file were to be installed (if an `i` is in the first column or it is blank) or removed (if the first column contains an `r`). The files list does not show files in a currently installed subsystem that are not included in the new software (because they are obsolete) so numbers in this column do not necessarily add up to the net disk space change shown by the `list` command.
- The fifth column is a single character that tells the type of file.
 - `f` Plain file
 - `d` Directory
 - `b` Block special
 - `c` Character special
 - `l` Symbolic link
 - `p` Fifo (named pipe)

- The sixth column give the file name. Every file in every subsystem that matches the arguments given to the `files` command is shown.

10.8 Syntax Summary

This section contains a syntax summary of *inst* commands. It defines the permissible arguments for each of the commands on the *inst* menus.

inst commands:

```
<main_menu_cmds>
<admin_menu_cmds>
<interrupt_menu_cmds>
```

<main_menu_cmds>:

```
<from_cmd>
<list_cmd>
go
<install_cmd>
<remove_cmd>
<keep_cmd>
<step_cmd>
<versions_cmd>
<help_cmd>
<admin_cmd>
quit
<set_cmd>
<sh_cmd>
<shroot_cmd>
?
<Enter>
```

<from_cmd>:

```
from
from <tape_source>
from <non_tape_source>
```

<tape_source>:
tape
<server>: tape
<user>@*<server>*: tape
<nrtapedevice>
<server>: *<nrtapedevice>*
<user>@*<server>*: *<nrtapedevice>*
\$dist

<server>:
string (workstation name)

<user>:
string (user ID)

<nrtapedevice>:
string (tape device full pathname)

<non_tape_source>:
<dir>
<dir> / *<product_name>*
<server>: *<dir>*
<server>: *<dir>* / *<product_name>*
<user>@*<server>*: *<dir>*
<user>@*<server>*: *<dir>* / *<product_name>*
\$dist
\$dist/*<product_name>*

<dir>:
/CDROM/dist
<CDdir> / dist
<distdir>

<CDdir>:
string (CD mount point directory full pathname)

<distdir>:
string (distribution directory full pathname)

<product_name>:
string (product name)

```
<list_cmd>:  
list  
list <keywords>  
list <names>  
list <keywords> <names>  
list <list_keyword>  
list <list_keyword> <names>
```

```
<keywords>:  
<keyword>  
<keyword> <keywords>
```

```
<keyword>:  
all  
default  
install  
installable  
installed  
keep  
newer  
older  
removable  
remove  
uninstalled  
a  
d  
i  
k  
q  
r  
A  
I  
L  
N  
U  
X
```

```
<names>:  
<name>  
<name> <names>
```

<name>:
 <product>
 <product> . *<image>*
 <product> . *<image>* . *<subsystem>*

<product>:
 string (product name)
 wildcard_string (product name with shell-type * wildcards)

<image>:
 string (image name)
 wildcard_string (image name with shell-type * wildcards)

<subsystem>:
 string (subsystem name)
 wildcard_string (subsystem name with shell-type * wildcards)

<list_keyword>:
 images
 products
 sizes

<install_cmd>:
 install
 install *<keywords>*
 install *<names>*
 install *<keywords>* *<names>*

<remove_cmd>:
 remove
 remove *<keywords>*
 remove *<names>*
 remove *<keywords>* *<names>*

<keep_cmd>:
 keep
 keep *<keywords>*
 keep *<names>*
 keep *<keywords>* *<names>*

<step_cmd>:
step
step *<keywords>*
step *<names>*
step *<keywords>* *<names>*

<versions_cmd>:
versions
<versions_subsys_cmd>
<versions_files_cmd>
<versions_remove_cmd>

<versions_subsys_cmd>:
versions *<vs_options>*
versions *<vs_options>* display
versions *<vs_options>* display *<names>*
versions *<vs_options>* *<names>*
versions display
versions display *<names>*
versions *<names>*

<vs_options>:
<vs_option>
<vs_option> *<vs_options>*

<vs_option>:
-a
-b
-n
-p
-r *<root>*
-v
-I

<root>:
string (directory full pathname)

<versions_files_cmd>:
versions *<vf_options>*
versions *<vf_options>* *<listtype>*
versions *<vf_options>* *<listtype>* *<names>*
versions *<vf_options>* *<names>*
versions *<listtype>*
versions *<listtype>* *<names>*
versions *<names>*

<vf_options>:
<vf_option>
<vf_option> *<vf_options>*

<vf_option>:
-c
-e *<pattern>*
-i *<pattern>*
-k
-m
-p
-r *<root>*
-s
-u
-v
-x
-S
-U

<pattern>:
string (file name pattern)

<listtype>:
list
list user
long
long user
config
changed

```
<versions_remove_cmd>:  
versions remove <names>  
versions -r <root> remove <names>  
versions -v remove <names>  
versions -r <root> -v remove <names>
```

```
<help_cmd>:  
help  
help <topic>
```

```
<topic>:  
see list in Table 10-1
```

```
<admin_cmd>:  
admin  
admin <admin_menu_cmds>
```

```
<admin_menu_cmds>:  
<set_cmd>  
<date_cmd>  
<files_cmd>  
space  
recalculate  
<sh_cmd>  
<shroot_cmd>  
<mount_cmd>  
<umount_cmd>  
<mfks_cmd>  
<return_cmd>  
<help_cmd>  
quit  
?  
<Enter>
```

<set_cmd>:

set
set *<option1>*
set *<option1>* on
set *<option1>* off
set *<option2>*
set *<option2>* *<integer>*
set shell
set shell *<shell_path>*
set instmode
set instmode *<mode_value>*
set wrapmode
set wrapmode *<wrap_mode>*

<option1>:

autoselect
beep
clearprompt
delayspacecheck
detailspacecheck
fullmenu
menus
neweroverride
overprint
share
verbose
verboselist
verboserm

<option2>:

columns
lines
timeout

<integer>:

integer (non-negative)

<shell_path>:

/bin/sh
/bin/csh
string (full pathname of any IRIX shell)

<mode_value>:
normal
prototype
client

<wrap_mode>:
wrap
truncate

<date_cmd>:
date
date *<format>*
date *<current_date>*
date -n *<current_date>*

<format>:
string (date output format specified by *date(1)*)

<current_date>:
string (current date as specified by *date(1)*)

<files_cmd>:
files
files *<names>*

<sh_cmd>:
sh
sh *<cmd>*

<cmd>:
available IRIX command

<shroot_cmd>:
shroot
shroot *<cmd>*

<mount_cmd>:
mount
mount *<fsname>*
mount *<dir>*

<fsname>:
string (file system name)

<umount_cmd>:
umount *<fsname>*

<mkfs_cmd>:
mkfs
mkfs *<devices>*

<devices>:
devices (arguments to *mkfs(1M)*)

<return_cmd>:
return
return *<main_menu_cmds>*

<interrupt_menu_cmds>:
stop
continue
<set_cmd>
<help_cmd>
?
<Enter>

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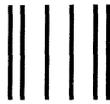
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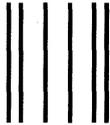
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