Chapter 1

Introduction

Silicon Graphics software is distributed on compact discs (CDs). A CD contains one or more software products and any special tools that the products require for installation. The purpose of the installation utility, *inst*, is to transfer distribution software, which has an encoded format, to a hard disk in a format that is usable. The installation utility offers two user interfaces: a graphical interface, called Software Manager (documented in the *Personal System Administration Guide*); and a command line interface, called Inst (the subject of this guide).

The media containing installable software that you purchase from Silicon Graphics is referred to as a *distribution*. Most distributions are not specific to a particular model of Silicon Graphics computer; distributions ordinarily contain all versions of any hardware-specific files that might be required. Sometimes, however, a new server or personal workstation model is introduced, accompanied by a special software distribution. When this occurs, subsequent distributions are fully compatible with the new model.

Software Product Releases

A *software product release* contains all software required to support a given version of a product and the tools that are needed to install the release. One or more software product releases are contained in a distribution (see Figure 1-1).

When you install a software product release, files from previous versions of the release are automatically removed before the new files are installed (the exception is configuration files, which are saved if they contain local modifications). If a product release includes hardware-specific files, the installation utility automatically determines the file version that is needed on a particular model and installs that version.

Product releases may have prerequisites that require a particular installation order. They might also have compatibility requirements with other installed products. Inst protects users against potential problems by preventing installation if there are any unresolved incompatibilities or prerequisites (unless you override this safeguard).

Installation instructions, including prerequisites and incompatibilities information, are provided in the product release notes, which are always included as an installable subsystem of the product. You can read product release notes from the distribution CD using the *CDgrelnotes* or *CDrelnotes* command. Instructions for reading release notes are included in the CD jewel case insert.

Figure 1-1 illustrates the hierarchical structure of a software distribution that comprises three software product releases.

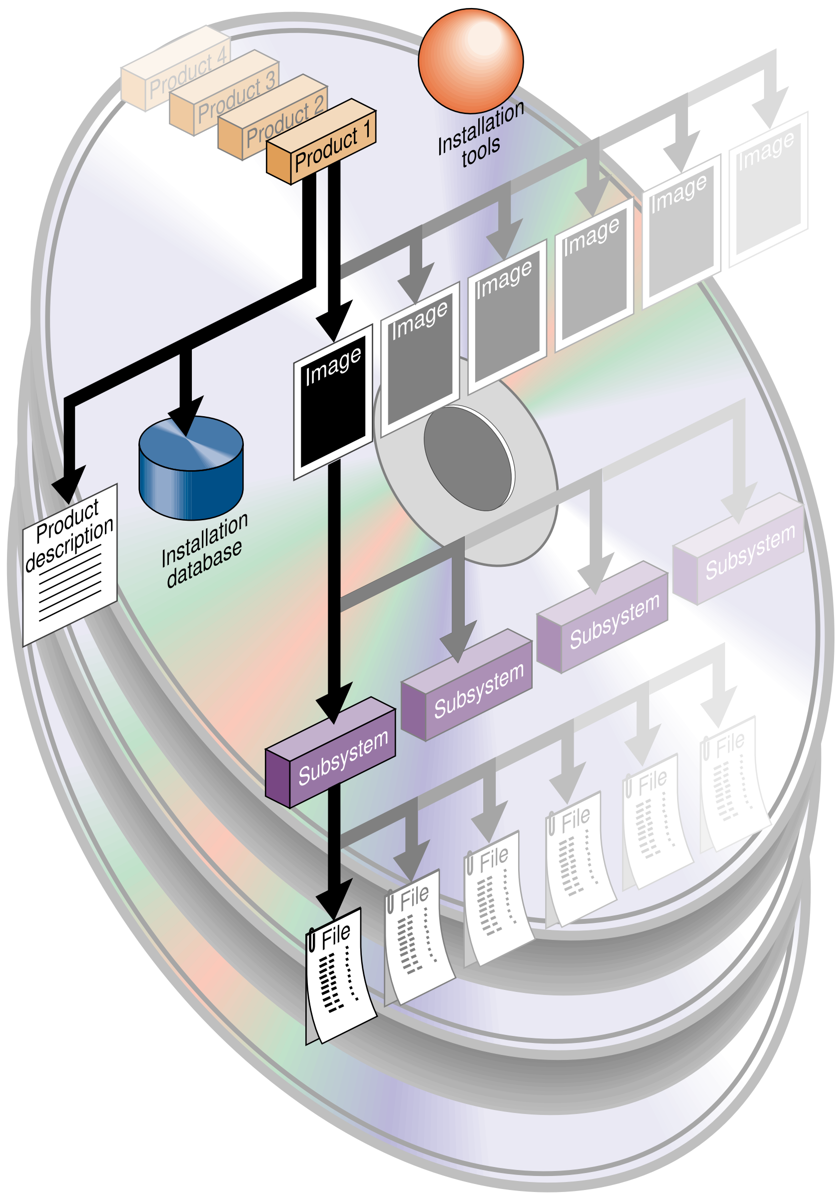

Figure 1-1 Components of a Distribution

Anatomy of a Software Product

A *software product* is a collection of files that support either a germane system function or a specific application. A small number of products support critical functions and must be installed if the system is to operate; other products are not critical but optimize system operation and are recommended for installation by the manufacturer. A subset of required and recommended products is installed in servers and workstations before they leave the factory.

A software product comprises three elements: a *product description*, an *installation database*, and one or more *images*, which are composed of *subsystems*. Products are known to Inst by a *shortname*, which is an abbreviation of the formal product name. For example, the shortname of the Fortran 77 Compiler product is *ftn_dev.*

Product Descriptions

The *product description* is a file that contains information about product requirements and the installation environment for the product. The name of the product description file is the shortname for the product. For example, the name of the product description file for the Fortran 77 Compiler product is *ftn_dev.*

The Installation Database

The *installation database* is a file that contains installation information for every file in the product. The name of the installation database is the shortname with an *.idb* extension. For example, the name of the installation database for the Fortran 77 Compiler product is *ftn_dev.idb*.

Images

An *image* is a collection of installable files that perform a similar or complementary function. Typically, each software product contains at least two images. This modularity allows for tailoring installations. For example, it is possible to install the images that contain the executable programs of a product without installing the release notes image.

The name of an image is the product shortname followed by an extension that describes the image's function. For example, *ftn_dev.sw* is the image in the Fortran 77 Compiler product that contains files for program execution, and *ftn_dev.man* is the image that contains documentation files.

Subsystems

Images are composed of one or more *subsystems*. In a software product release, a subsystem is the smallest installable unit of software; the files that make up a subsystem cannot be installed individually (see "Patch Releases" on page 8 for exceptions). Subsystems are assigned three-part names of the form product.image.subsystem. For example, *ftn.sw.ftn* and *ftn.sw.utils* are subsystems in the Fortran 77 Compiler product.

Required and Default Subsystems

Some subsystems in a software product are classified as *default* subsystems. Default subsystems support the basic functions of a product and are suggested for installation by the manufacturer. Where disk space is limited, the default subsystems serve as a guideline for determining what to install.

Some default subsystems are also classified as *required* subsystems. Required subsystems are critical to system operation; without them, IRIX will not operate. Inst prevents users from exiting an installation session if a required subsystem is available for installation but not installed (unless you choose to remove this safeguard).

When Inst is initialized, it makes preliminary selections of the subsystems to be installed during the session. If a target system contains no software, the preliminary selections always include all required and default subsystems; on targets with software installed, the default selections are all upgrades to the installed software that the distribution contains. When subsystems are displayed during an installation session, default subsystems are tagged with the letter *d* and required subsystems are tagged with the letter *r*.

Factory-Installed Subsystems

Some subsystems from the *eoe*, *motif_eoe*, and other standard (no-cost) products are factory installed. The *eoe* product contains basic operating system software, utilities, and window system software. Extra-cost software options, such as NFS® (the Network File System) and compilers, are not factory installed.

To display the inventory of software that is installed on a system when you receive it, use the program *showprods* (see the showprods(1M) reference page):

```
% showprods
```

The output of *showprods* is one line for every product, image, and subsystem installed on the target. You can remove any factory-installed software that you do not need, except required subsystems.

Patch Releases

A *patch* is a collection of one or more files that correct flaws in the performance, reliability, or security of a specific software product; a *patch release* is a distribution containing one or more patches. Each patch remedies a specific set of reported errors in the version of the product to which the patch applies.

Every patch is identified by a unique number, such as *patchSG1234567*, for example. The number is used in manufacturing to identify the collection of errors that the patch corrects. Typically, the reported errors that result in a patch release occur only under certain operating conditions. For this reason, installing a patch is necessary only if a system or site is experiencing a problem that the patch addresses.

The structure of a patch is similar to that of a software product (see Figure 1-1); however, the subsystems in a patch may span several products. For example, a patch for the FDDI product might contain file replacements for *eoe* and *fddivis* subsystems. Patches are different from standard products in another important way: installing a patch replaces individual subsystem files, not the entire subsystem.

Patches are not dependent on other patches; they rely only on the software components in the original version of the affected product. A patch might be incompatible with other patches, however. Compatibility requirements and installation instructions are described in installable release notes, which you can read from the distribution CD using the *CDgrelnotes* or *CDrelnotes* command. Instructions for reading release notes are included in the CD jewel-case insert.

Sources of Installable Software

The location of a software distribution is known as the *distribution source*; the system receiving software during an installation is known as the *target*. A distribution source may be a CD that is mounted on the target, a CD that is mounted on a remote system, or a centralized directory on the network to which the distribution has been copied (see Figure 1-2). The directory on a distribution CD that contains the software is always called */dist*.

A server or personal workstation that supplies a distribution source to remote targets is known as an *installation server*. An installation server can provide the distribution source from a local CD-ROM drive or from a disk directory that contains the installable images. A directory of installable software is known as a *distribution directory*. A distribution directory may contain software from several distributions.

Figure 1-2 illustrates local and remote distribution sources.

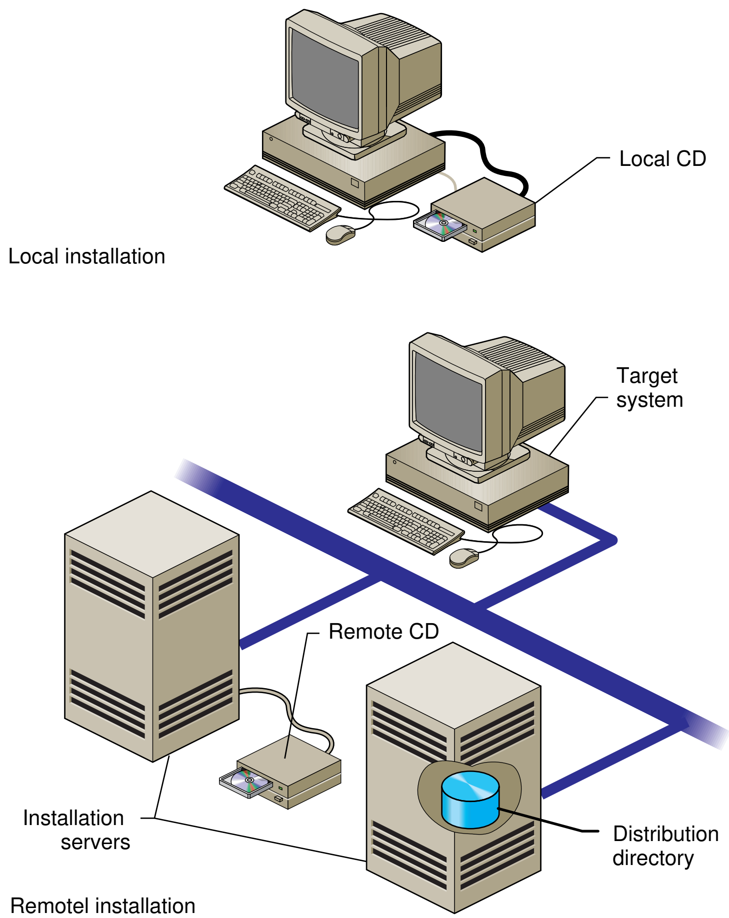

Figure 1-2 Software Distribution Sources

Software Installation Methods

As of IRIX 5.3, most software installations can be performed without interrupting system operations. Installations that are performed without shutting down the system are referred to as *live installations*. Live installations are preferred because they are usually less time-consuming and because other system operations can be sustained during the installation session.

Whenever software installation affects fundamental IRIX functions (such as device management), software must be installed by a *miniroot installation*, which requires a system shutdown. During a miniroot installation, a special set of installation tools is copied to the swap partition of the system disk on the target. The software environment that these tools create for the installation is referred to as the *miniroot*. Only a portion of the IRIX operating system is available in the miniroot.

Introduction to Inst

Inst is invoked automatically when you do a miniroot installation; it is invoked from the command line when you do a live installation. After Inst is invoked, its Main menu is displayed.

Note: It might be useful to look ahead at Figure 4-1 for an illustration of the installation process while reading this Introduction.

Figure 1-3 illustrates the Main menu.

```
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]     Interactive mode for install/remove/keep
 8. conflicts [choice ...]      List or resolve installation conflicts
 9. help [topic]                Get help in general or on a specific word
10. view ...                    Go to the View Commands Menu
11. admin ...                   Go to the Administrative Commands Menu
12. quit                        Terminate software installation

Inst>
```

Figure 1-3 The Main Menu for Inst

Automatic Initialization

During initialization, Inst reads the information in product descriptions and the installation database, makes preliminary selections of subsystems to install (see "Required and Default Subsystems" on page 7), and calculates estimated space requirements. Initialization is triggered when you issue the first command of the session that requires Inst to collect information about the distribution of the target software.

The Main Menu

The Main menu contains all commands that are needed to install and remove software. When the Main menu is displayed, Inst posts this prompt to accept command entries:

```
Inst>
```

Changing the Distribution Source

Inst always assumes that the installation target is the system where it is running. Inst selects a default distribution source, which is either the distribution source of the previous installation (during live installations) or local CD-ROM (during miniroot installations). You can specify a different distribution source using the *from* command.

Viewing the Software Inventory

The *list* command displays an inventory of the software on either the distribution or the target system. Displaying software inventories early in a session is helpful in deciding what software to install or remove. By default, the output of *list* displays the shortnames of subsystems in the distribution inventory, their size and description, and selection and installation information.

Using the *view* command, you can toggle the *list* command so that it displays either the distribution or the target inventory. The *view* command also focuses list output on different levels of the product hierarchy, so that you can display information about images or entire products. You can also use *view* to filter certain information from *list* displays.

Selecting and Installing Software

You can install the preliminary installation selections that Inst makes during initialization or change the selections before launching an installation. The *install* command selects items in the distribution inventory for installation; the *remove* command selects items on the target inventory for removal. The *keep* command selects items on either list for which no action should be taken. A special selection command, *step*, allows you to list and select software at the same time.

You can change selections as many times as necessary, so long as you do not issue the *go* command, which launches the installation.The *go* command initiates the installation and removal of software that you specified in your selections.

Handling Conflicts

Sometimes, the selections that you make for installation or removal cause conflicts. For example, a conflict occurs when you select two incompatible subsystems for installation, or when you select a subsystem for installation and do not select its prerequisites. When conflicts occur, the *go* command does not execute, and Inst posts a conflict advisory that suggests a resolution to the conflict.

When you see a conflicts advisory, you can either use the *conflicts* command to accept one of the suggested resolutions or use the *install* and *remove* commands to change your selections. You also see an advisory if your selections require more disk space than is safely available. This condition requires that you change your selections or remove software from the target system.

Ending a Session

To end an Inst session, enter the *quit* command. When you quit an installation session, Inst performs clean-up operations on target filesystems and on the newly installed software.

Supplementary Menus

Inst offers three supplementary menus that you can use to augment Main menu functions:

- the View Commands menu

- the Administrative Commands menu
- the Interrupt menu

The View Commands menu (shown in Figure 5-1 on page 66) contains selections that let you control information displays during the session. For example, a listing of distribution software normally includes all of the products that the distribution contains. Using the View Commands menu, you can request a list of the new software products only.

The Administrative Commands menu (shown in Figure 5-2 on page 73) contains two types of selections: commands that let you display or adjust conditions on the target system, such as the *mount* and *umount* commands; and commands that let you control Inst operations, such as the *recalculate* command.

The Interrupt menu (shown in Figure 5-3 on page 81) is used to suspend command processing. It is rarely necessary to display this menu during a session, and Inst displays it only under unusual error conditions.

Getting Help During Installations

During an installation session, you can use the *help* command from any menu to get information about almost every Inst command and command argument. Enter the *help* command alone to get general instructions on using online help. Enter the *help* command followed by an argument to get help on the topic specified in the argument. Table A-1 gives a complete list of topics for which help is available.

This sample illustrates a *help* entry and the information that it provides:

```
Inst> help upgrade

                    upgrade U

"upgrade" is a keyword argument for the "install", "keep", "list", and
"step" commands. For example, "install U" requests that all subsystems
that are currently installed and have newer counterparts in the
software distribution be installed...
```

Understanding installation terminology and the Inst installation model is very important to using Inst successfully. To get this information, issue this command during an installation session:

```
Inst> help overview
```